MUNICIPAL JOURNAL

ISSUED WEEKLY

VOLUME XLIV
No. 17

April 27, 1918

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WEEKLY

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Calls for bids reaching New York Thursday will be published in the issue mailed next day.

Municipal Journal

Volume XLIV. NEW YORK, APRIL 27, 1918 No. 17

GRADE CROSSING ELIMINATION AT PASSAIC

Obtaining Property—Avoiding Damage Claims—Grading with Heavy and Light Steam Shovels—Mixing and Delivering Concrete—Sewer Reconstruction—Cost of the Improvement.

By R. F. ODELL, Bureau of Engineering, Passaic, N. J.

Important grade crossing elimination work is now being carried out at Passaic, N. J. This city has a population of about 75,000 and is situated on the Boonton branch of the Delaware, Lackawanna and Western Railroad, about thirteen miles west of New York City.

The work in question was undertaken to do away with a dangerous condition caused by two main highways, which enter Passaic from the south and west, intersecting very nearly on the railroad right-of-way, which crosses the highways at grade at an angle of approximately 45 degrees, on a 3 degree curve.

Van Houten avenue, which bears a large amount of traffic, is 36 ft. wide between curbs and taps a large farming district, as well as forming one of the main touring routes to the mountain summer resorts and the Delaware Water Gap. Passaic avenue, entering the city from the southwest, is one of the contemplated main trunk highways of the new state highway system, and was formerly 40.2 ft. between curbs, but when completed it will have two 24 ft. roadways.

Preliminary Studies. The elimination of the grade crossings had been considered for a period of several years prior to the adoption of the final plan, but nothing definite was done until 1915, when the matter was finally pushed by the railroad company to a point of serious discussion.

Preliminary studies were made of alternative plans for elevation and for depression of the highways. A movement was also put under way by a body of property owners in the vicinity for the depression of the railroad. This was shown to be impracticable, after a thorough study by the city engineer, and the expense totally out of proportion with the benefits derived therefrom.

The plan to carry the highways over the right-of-way by means of a single bridge, as first proposed by the railroad company and advocated by a number of citizens, was also abandoned, due to the necessarily high embankments, steep grades, consequent damage to property, and danger of accidents.

It was finally agreed to depress the highways. Passaic avenue, already 67 ft. wide, was widened 12½ ft. on each side, a total width of 92 ft. being thereby obtained from the railroad to the southwesterly boundary of the Park, a distance of about 1,100 ft. Van Houten avenue was shifted about 80 ft. in a southerly direction, in order to obtain an easier and safer approach to the subway. The easterly side of Lackawanna place was also widened about 10 ft. The grades have been so arranged as to not exceed 6 per cent. at any place.

Damages and Purchase of Property. In consequence of the resulting damages, it was considered advisable to acquire certain property, and with this end in view a tract of 1.75 acres on the westerly corner of Passaic and Van Houten avenues was bought by the city. The acquisition of this property avoided excessive damage claims, allowed the shifting of Van Houten avenue, and made available a considerable amount of excavation which was used in grading other portions of the park, near the lake. This property was also a valuable addition to the park lands. Negotiations have also been completed for the purchase of the Barry property, on the north corner of the same streets.

The railroad company has recently acquired a long-term lease on a strip of park property along the westerly side of its right-of-way to provide for the extra fill required for tracks to be laid in the future. The property covered by the new station and grounds was also included in this lease.

Ordinances and Contracts. An ordinance was passed by the Board of Commissioners on August 29, 1916, providing that the railroad company depress Passaic and Van Houten avenues, Lackawanna place and Richards street; fill in the park lands; construct temporary detours; build a new station and station grounds, and a subway between the stations, without cost to the city. In addition, the railroad company constructed the 42-inch storm sewer, the city agreeing to pay 50 per cent. of the cost of construction upon presentation of proper bills.

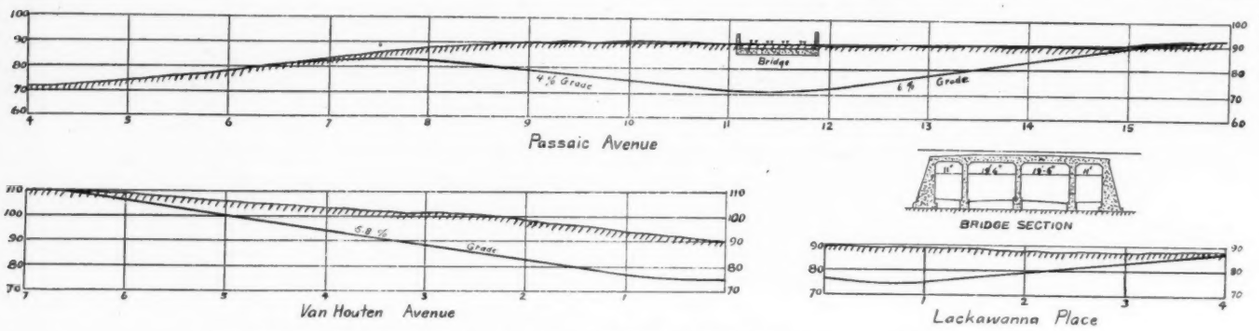
The ordinance further provided that the city do all paving and curbing and lay all sidewalks and separate sewers, the railroad company to pay $8,200 toward the cost of same. Also that the railroad company and the city share equally in the payment of such damages to property as might result, and in the cost of purchasing such property as was necessary. The title of all property purchased in this manner remains vested in the city.

The contracts for portions of the work were let in the early spring of 1917, H. F. Curtis, Inc., New York City, obtaining the contract for the work for the railroad company. The Union Building and Construction Company, Passaic, N. J., was the successful bidder for the separate sewers, paving and curbing, and laying sidewalks on all the streets affected, with the exception of the Van Houten avenue pavement, which will be laid by the county.

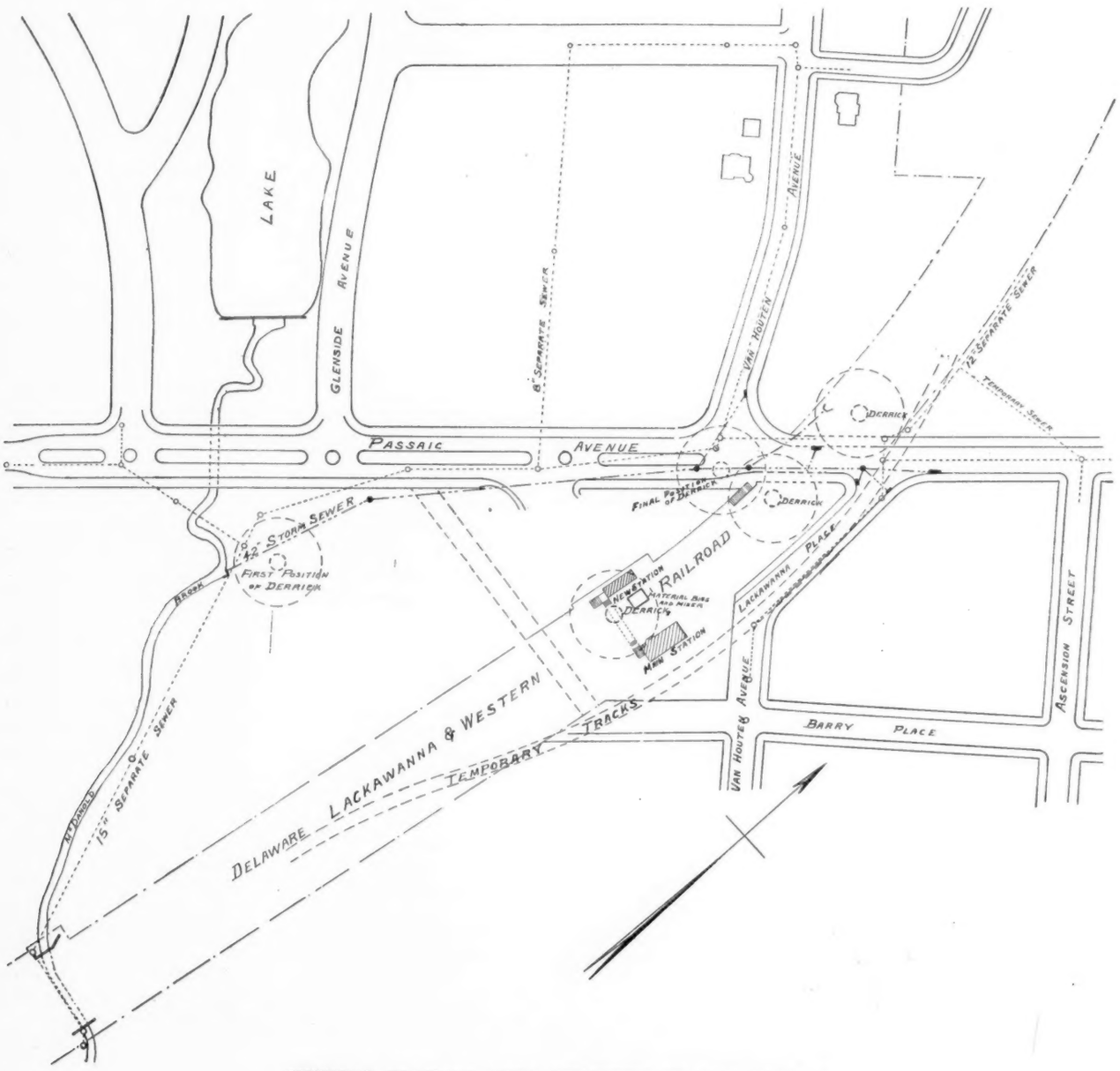
Grading. The work was started in April, 1917, by grading the portion of the park property to be used for

the new station and grounds. This grading, as well as all of the excavating for the depression of the various streets, was accomplished by a Marion Model 80 steam shovel, with a 2½ yd. dipper, which loaded the spoil onto narrow-gauge side-dump cars of 6 cu. yds. capacity.

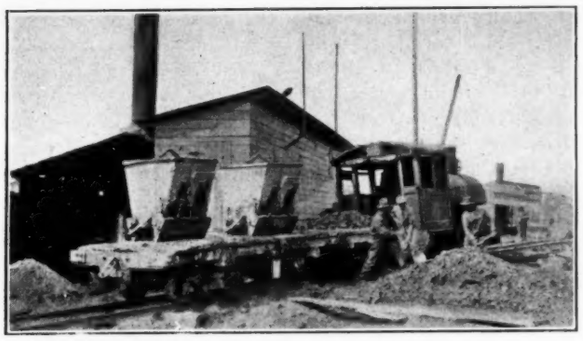
The shovel then proceeded in a northwesterly direction across Passaic avenue to the "Burns Tract," which was cut down several feet. The equipment was then returned to Passaic avenue and worked down-grade toward the railroad and hence northwesterly along Van Houten avenue to Richards street and Bradford avenue,



PROFILES OF STREETS GRADED, SHOWING ORIGINAL AND NEW GRADES.

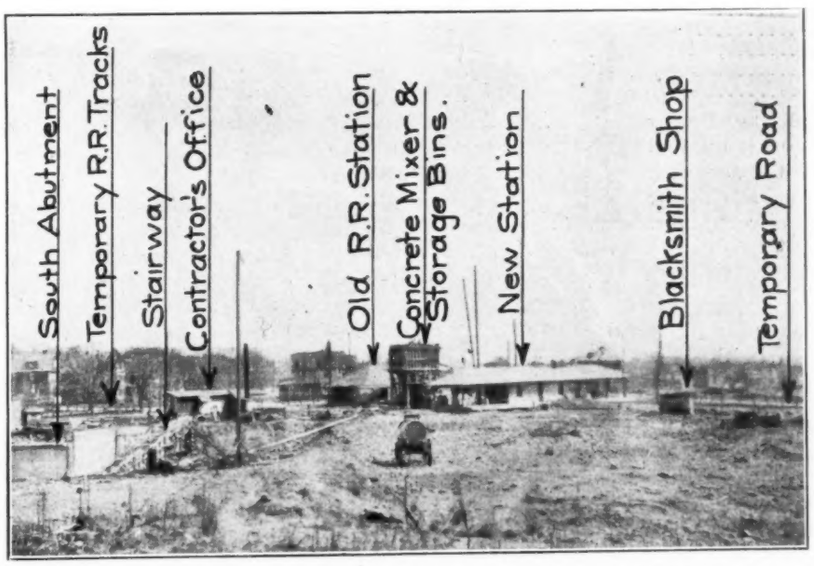


GENERAL PLAN OF AREA AFFECTED BY REGRADING.



FLAT CAR WITH CONCRETE BUCKETS.

afterwards returning to Passaic avenue to complete the excavation for the bridge site. The spoil was removed by two trains of four dump cars each. The material removed from the two streets was used for filling the park land near the lake, and for widening the railroad embankment south of the station. Rock was encountered at a depth of 15 to 18 ft. below the original street surface and was removed by drilling and blasting.



GENERAL VIEW, SHOWING NEW STATION AND CONTRACTOR'S PLANT.

A small Thew revolving steam shovel with a ¾-yd. dipper was used for trimming and terracing the southerly slope of Van Houten avenue, and for the light grading on Richards street and Bradford avenue and at the upper end of Van Houten avenue. The balance of the excavating, northeast of the railroad, cannot be started until the new bridge is completed and the temporary tracks are removed.

Concrete Plant. The abutments for the four-track reinforced concrete slab bridge were founded on solid rock, and were constructed rapidly with concrete mixed at a central plant located at the railroad station, about 300 ft. from the south abutment and 475 ft. from the north abutment.

The plant consisted of a 1-yd. mixer, driven by a vertical steam engine, into which the sand and gravel were discharged directly from an elevated storage bin of 120 cu. yds. capacity. The concrete was discharged directly from the mixer into two 1¼-yd. buckets carried on a narrow-gauge flat car, and thence conveyed to the abutments.

Three buckets were used in the concreting operations, one being emptied while the other two were returned to the mixer. The buckets were handled by ten-ton derricks located at each abutment. Three hundred and twenty cu. yds. of concrete were placed in 15 hours by this method.

New Station and Subway. A new brick and limestone station, with a concrete platform, has been built on the westerly side of the tracks, opposite the old station, but is not yet fully completed. The old and new stations are connected by a new reinforced concrete subway for pedestrians, under the main tracks.

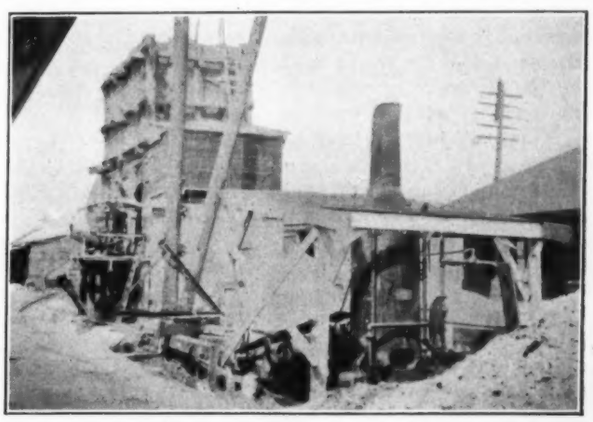
Storm Sewer. The construction of a 42-inch reinforced concrete storm water sewer from McDonald's brook to Van Houton and Passaic avenues was made necessary by the collection of a large quantity of storm water at the low point in the grades of those streets near the bridge. The trench was excavated and backfilled by means of a derrick with a clamshell bucket and 75 ft. boom, which was shifted along the trench as the work proceeded. The pipe was placed by means of a large hook made from a steel rail and attached to the main falls of the derrick.

Separate Sewers. Owing to the changes in the street grades, it has been necessary to provide for the construction or replacement of about 1,600 ft. of 15-inch and 3,000 ft. of 8-inch vitrified pipe separate sewers, to cost at completion about $15,600.

The 15-inch sewer, which acts as an interceptor, was carried under the railroad embankment by means of 16-inch cast iron pipe incased in concrete, passing through the opening formed by the stone culvert over McDonald's brook. The 8-inch sewers have been completed through the park and Bradford avenue and through Van Houten avenue; those northeast of the railroad will be constructed when the grading is completed.

Retaining Walls. Gravity type concrete retaining walls, with stairways incorporated, have been constructed in front of three residences on Van Houten avenue, in accordance with the agreement with the railroad company. In addition, $5,600 damages were paid the three owners.

Pavements. Pavements, curb and sidewalks will be laid on the various streets and avenues as follows: Passaic avenue, sheet-asphalt on concrete base, 9,500 sq. yds.; Van Houten avenue and Lackawanna place, "Amiesite," 4,400 sq. yds.; Richard street, Barry place



CONCRETE MIXER AND MATERIAL BINS.

and Ascension street, asphalt-bound macadam, penetration method, 3,500 sq. yds.; 8,200 lin. ft. of concrete curb; 28,000 sq. ft of concrete sidewalk. The asphalt-bound macadam pavement on Barry place was laid in the summer of 1917, to accommodate the increased traffic due to the use of the street as a detour.

Park Development. As a part of the general scheme, the adjoining portions of the Third Ward Park are to be improved by the city. In general, the improvement consists in grading and developing, on a conventional plan, the portion of the park west of Passaic avenue, and a new baseball field southwest of the station. It is the intention to develop the neighborhood into a fitting entrance to the city.

Cost of Improvement. Figures relating to the cost, amount of excavation, etc., of the railroad company's part of the work could not be obtained by the writer. The city's share amounts to approximately $106,425, not including the park development, which will probably extend over a period of several years. The cost is divided as follows:

Pavements, curb and sidewalks, not including pavement on Van Houten avenue	$46,000
Amiesite pavement, Van Houten avenue	5,700
Grading property formerly of M. F. Burns	8,600
Separate sewers	15,600
Storm sewer	7,500
Property purchased	19,000
Damages	4,025

The work is being done for the railroad company by H. F. Curtis, Inc., contractors, of New York City, and for the city by the Union Building and Construction Co., of Passaic, N. J. J. G. Ray is chief engineer of the D., L. & W. R. R., and Colin R. Wise is city engineer of Passaic, N. J.

TRAFFIC LAWS AND HIGHWAY MAINTENANCE AND CONSTRUCTION.*

Destructive Effect of Speed on Different Kinds of Roads, with Different Tires and Loads—Uniformity of Speed Regulations.

By CHARLES CARROLL BROWN.

SPEED.

Comprehensive speed regulations must be formed after a careful study of the relations of speed, weight of cars, surface of road, kind and design of tire, and condition of road bed. The limits for gravel, macadam, bituminous macadam and asphalt macadam were stated by Mr. McLean in saying that a light car can travel at 18 or 20 miles an hour over such roads without seriously injuring them, whereas heavy cars at 40 to 50 miles an hour wear the road out rapidly, largely because of the shearing action of the rubber-tired driving wheels upon the surface. This shearing action increases as the square of the speed, with the same car and weight. Thus the destructive effect at 20 miles is four times as great as at 10 miles an hour, at 30 miles it is 9 times and at 50 miles is 25 times. If 20 miles is the limit of speed of a light car at which the shearing action of the traffic becomes serious, it is evident that at 50 miles the destructive effect will be 6.25 times as great and the road will require six times the repair, or say, if a road would last 6¼ years under light cars at 20 miles speed, it would last but 1 year under the same cars at 50 miles speed.

When the weight increases, the shearing action increases. There has been no statement of the rate of increase, but it is probably proportional to the weight, so that a car weighing 5 tons would, at the same speed, have five times the effect on the road as one of 1 ton. So the 5-ton car at 50 miles would have 31¼ times the destructive effect of the 1-ton car at 20 miles speed. While far from exact, these figures show the great necessity of regulating speeds over this class of roads, and of providing hard surfaces where weight, speed and amount of traffic must be greater than the softer roads can carry.

Steel tires are destructive of hard-paved roads, as well as of the softer surfaces, and require regulations as to form, size, weight and speed that are more restrictive than those for rubber tires, because there is practically no limit to the burden that can be put on a steel tire, while the rubber tire has rather definite limits of possible loads at a given speed (said to be 750 lbs. per inch of width) or possible speed with a given load, so that the inverse relation of speed and load has a tendency in the interest of economy to regulate the speed and load, it being necessary only to regulate the careless driver and the driver who fails to consider the principles of economy and pushes through at the expense of tires and with the exceptionally destructive effect of his defective tire upon the pavement after his rubber tire has begun to go to pieces.

In regulating speed, therefore, there must be

1. Differences according to the nature of the road, as constructed of
   a. Gravel and macadam.
   b. Bituminous and other well bound gravel or stone macadam.
   c. Paved roads.

It may be that paved roads should be divided into block and monolithic, though the present tendency is to construct block pavements in such manner as to be practically monolithic and to reduce to a minimum expansion joints in pavements that would be monolithic without them; and it may be assumed as probable that the pavement of the future will be monolithic.

2. Differences in tires.
   a. Pneumatic.
   b. Hard rubber.
   c. Steel.
   d. Defective tires.
   e. Chains and other temporary appliances affecting contact of tire with road.
3. Differences in loads.
   a. Total load on vehicle.
   b. Total load on one axle.
   c. Load on one wheel.
   d. Load per inch width of tire.
   e. Load on motor truck.
   f. Load on trailer.
   g. There should be added a division for loads on horse-drawn vehicles, speed of which is limited by the speed of the horses, and loads on which should therefore be subject to regulations different from those made for motor vehicles.
   h. Diameter of wheel and its effect on load and speed.
   i. The kind of springs on the vehicle and their effect on load and speed.

The inter-relation of these three classes of variables affecting the economical speed of the vehicles have not been studied carefully and as a consequence each authority establishing speed regulations has constructed them to fit the conditions and information nearest at hand. There are therefore many differences in regulations, and trucks fitting the laws of one state or the ordinances of one city cannot be used in the next state or city, without violating its regulations. New Jersey

*Concluded from page 326.

seems to have made a more intensive study of the problem than any other state, and its regulations seem to fit fairly well the conditions in that state, particularly those of the road surfaces; but they do not cover all conditions and must be broadened somewhat in all three of the divisions made above.

Now that motor trucks are becoming freight carriers for short hauls, they must pass from state to state, across many counties and through many cities and towns. It is very necessary, therefore, that there be uniformity in traffic regulations. It is possible in the regulation of speed, to make the rules cover all kinds of road surfaces, all kinds of tires, all weights of load, without reference to whether the particular state, county or other municipality has them all or not, as only those regulations could be enforced which apply to the local conditions. In this matter of speed regulation, therefore, it should be possible for the state authorities first to get together and agree upon a uniform system, which would then be adopted by or imposed upon the subordinate governmental organizations in each state.

The present variations in permissible speed of trucks under laws and ordinances (not including the judgment of the officers supposed to enforce them) are shown by the following from E. W. Stern's paper before the A. S. M. I:

Chicago, Ill.: Compatible with safety; 9 miles maximum for truck, 4 miles for truck with defective tire that would injure pavement.

Oakland, Cal.: 4-ton truck, 12 miles for rubber tires, 6 miles for iron or steel tires.

Massachusetts: 4 tons, 15 miles; 6 tons, 6 miles for iron or steel tires, 12 miles for rubber tires.

New Jersey: 4 tons, 12 miles with iron tires; 6 tons, 8 miles with iron tires, 10 miles with rubber tires. Proposed to rule out truck or trailers with iron tires, also lugs on tires or other metal except skid chains.

New York: Over 4 tons, 15 miles; over 6 tons, 6 miles with steel tires, 12 miles with rubber tires.

England: For iron tires, varies with weight on axle; for rubber tires, 12 miles for 6-ton truck; 8 miles if over 6-ton. If unladen car weighs 3 tons, 8 miles; if motor draws trailer, 5 miles maximum speed.

Instead of covering by strict regulations all the items affecting speed, it may in some states be desirable, at least so far as the cars licensed in the state are concerned, to fit the license fee in a general way to the destructive effect of the vehicle on the road. Horse-power and maximum possible weight (not rated capacity) together measure very roughly such effect and increase in fee with horse-power and with maximum weight of loaded car may fairly well impose on trucks their share of the expense of road maintenance due to their use on the roads. The fee should increase proportionately with the weight of the load and, beyond a standard minimum truck horse-power, should increase as the square of the horse-power.

Such license fees in lieu of some of the regulations of speed proposed may be justified in states where the roads are not yet improved enough to permit the general use of motor trucks and where population is so scattered as to reduce their use to a minimum in any event.

It may be possible also that regulations applying to hard-surfaced paved roads should not be adopted in states which are not constructing that class of pavements, but the use of trucks which require that class of pavements for their economical operation and which would wear out the roads of the state too rapidly should be prohibited or their use discouraged by high license fees and still greater restrictions as to speed than the standard of states with hard roads.

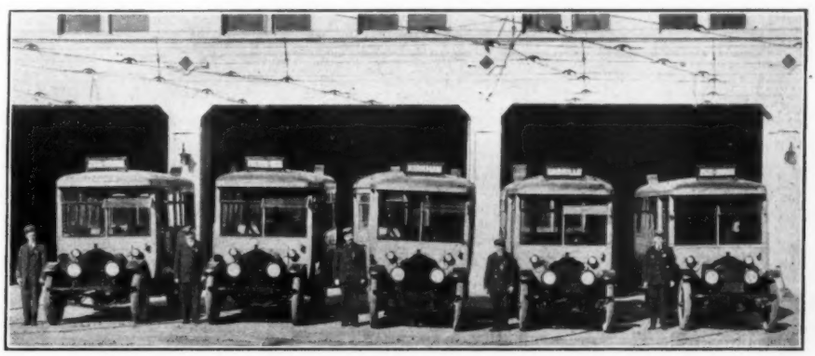
But, with a few exceptions as those mentioned, it should be possible to devise a set of speed regulations which could be adopted by practically all the states. They would act on the one side to standardize motor trucks and trailers and methods of using them, and on the other side to improve the standard of roads in all but the most highly developed sections of states which have taken the lead in road construction.

While such standard regulations might slightly retard some developments of the use of motor trucks, this would be offset by the standardization of trucks and their uses, and by the improvements in roads; and the regulations can be changed from time to time as the resulting orderly developments on both sides demand, and kept up to date and in full operation and effect.

SAN FRANCISCO'S MUNICIPAL BUS LINE.

The city of San Francisco operates a municipal bus line, said to be the first in the United States. It serves as an auxiliary to the municipal street railway system. Two lines of buses are run, one from the terminus of the street railway line at 48th avenue, the other across Golden Gate park.

The buses are operated by one man, who both drives the machine and collects fares, passengers paying as they enter. Each seats 18 passengers, while others can stand with the aid of sanitary straps. Electric-lighted route signals on the roof designate the terminal points. Regulation street car gongs, hand operated, are mounted on the roof. Electric push-button stop signals are placed opposite each seat. The cars were built by the White company. During the first five days of operation the three buses in service covered 728, 669 and 576 miles respectively.



SAN FRANCISCO'S MUNICIPAL MOTOR BUSSES.

Advantages of buses are that they eliminate the cost of power house, track, trolley wire and other features of trolley cars, both first cost and maintenance.

CONTRACT OR DAY-LABOR CONSTRUCTION.

Most of the counties furnishing the information tabulated in the April 20th issue stated whether or not work on each of the several classes of roads was done by contract or by day-labor. Of those reported, we find that all counties laid brick pavement by contract work, 95% of them laid concrete by contract work, 90% laid bituminous concrete, 63% laid water-bound macadam, 60% bituminous macadam, 55% gravel, 49% earth, and only 31% sand-clay. Speaking generally, this indicates that about two-thirds of the counties construct sand-clay roads by day-labor, one-half of them construct gravel and earth roads in that way, 40% construct bituminous and water-bound macadam, while not more than 10%

construct bituminous concrete, cement concrete, or brick. As the last named is generally laid on a concrete base, it may be said that very few counties did any concrete work by day-labor, but practically all of them let contracts for it.

It seems probable that a number of counties will this year do a greater amount of day-labor work than they did last, and that others will prepare to do such work that have not done it in the past. This is indicated by reports from a considerable number of the counties that they propose to purchase road machinery, such machinery including not only more than 150 road drags, more than 100 road graders and planers and about 50 scrapers, but also quite a number of concrete mixers, stone crushers, unloading devices, gravel screens, steam shovels, road rollers, scarifiers, as well as a very considerable number of motor trucks, tractors, trailers and dump wagons.

Counties that have no experienced superintendents or foremen to carry on construction work should undoubtedly let such work by contract rather than endeavor to perform it by inexperienced men, which can hardly fail to result in poor work and ultimate loss of money. On the other hand, there are several advantages in the construction of roads by the counties themselves, not the least being that, with machines and experienced men always on hand, the roads are apt to be maintained in better condition, repairs and improvements being made promptly wherever and whenever needed.

ECONOMIZING IN STREET LIGHTING.

Adopting Lamp, Globe, Reflector and Other Details to Secure Maximum Illumination of Street Surface with Minimum of Current.

In casting about for directions in which they can economize, cities should not overlook their street lighting. In many cases the power house or the lamps, or both, can be replaced with more efficient units, whereby equally effective street illumination can be obtained at appreciably less cost. Machinery may be difficult to secure under present conditions, and it may be owned and operated by a private company. But much can be done with new lamps, if those in use are not up to date. The use of old-type lamps at the present time is inexcusable. They should be replaced by modern high-efficiency lamps, which give two or three times as much light for the same energy.

Perhaps the greatest economy in street lighting is effected by directing a large proportion of the light in a downward direction onto the street, where it is useful. In addition to directing the light downward, it should be spread out so as to illuminate the space between units when they are spaced reasonably far apart.

The foregoing applies to "utilitarian" lighting rather than to "ornamental" white-way lighting in business districts, where the units are usually spaced relatively close and the upward light is useful in lighting the building fronts, which in turn reflect some of this light back onto the street. Even in the latter case the unit should give more light below the horizontal than above it.

The term "utilitarian," when applied to a street lighting unit, generally means a unit which hangs pendent, fed from overhead lines, and is equipped to deliver practically all its light in the lower hemisphere. The term "ornamental" generally means one that is more or less ornate in design and appearance, mounted on top of a pole or bracket and fed from underground circuits. The first type is the one in general use for street lighting throughout the country and its purpose is to deliver the most light on the street surface for the least monetary outlay.

A bare Mazda lamp, with the usual type of filament construction, gives off light in all directions, and whether it is burned tip up or tip down, about the same amount of light is given off above and below the horizontal. Unless the lamp is equipped with some kind of reflecting or refracting device, to catch the upward light and direct most of it downward, a large proportion of the total light emitted by the lamp is wasted. While it is desirable to have some light above the horizontal, it would only be in some special case that more upward light would be wanted than downward.

In certain restricted areas, residential districts and boulevard sections, underground wires are necessary and a more or less ornamental unit is desirable which

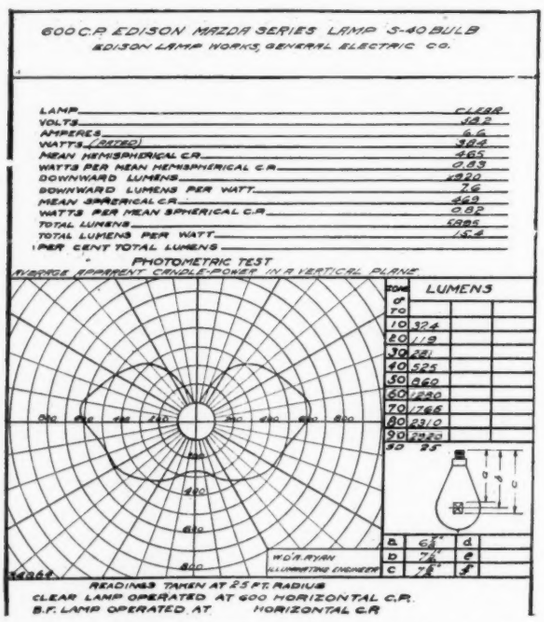


FIG. 1—LIGHT DISTRIBUTION OF MAZDA LAMP.

FIG. 4.

FIG. 2.

FIG. 3—GLOBE, REFLECTOR AND REFRACTOR.

can be mounted on top of a pole, and yet the illumination desired is of the utilitarian class. The General Electric Company has recently developed a fixture suitable for this class of lighting, designed at the Form 8 Novalux ornamental unit, with stippled glass globe and dome refractor. The complete unit, mounted on a pole, is shown in Fig. 2. This unit is equipped with a 3-section stippled glass globe, an internal reflector at the top, supporting a Holophane prismatic dome refractor, as shown in Fig. 3.

The stippled glass globe has a high transmission factor and screens the interior equipment from view without very much interference with the characteristic distribution of the refractor. This permits an ornamental design

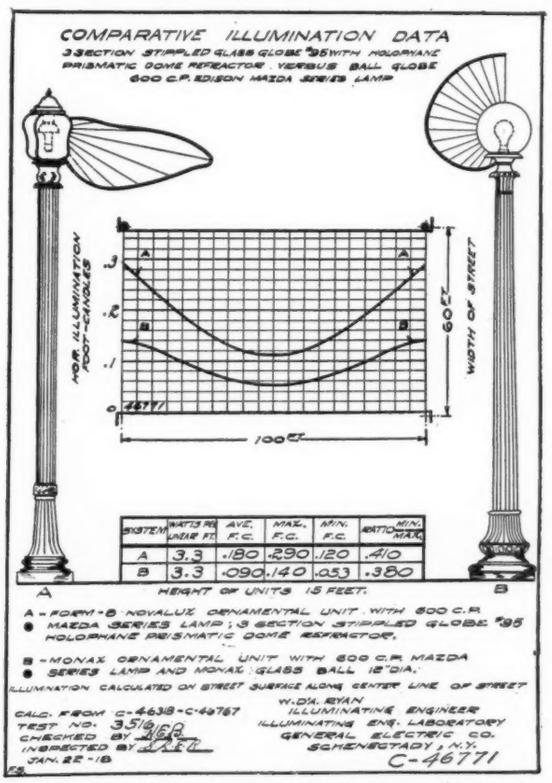

COMPARATIVE ILLUMINATION DATA
3 SECTION STIPPLED GLASS GLOBE #95 WITH HOLOPHANE PRISMATIC DOME REFRACTOR. VERSUS BALL GLOBE 600 C.P. EDISON MAZDA SERIES LAMP
HOR. ILLUMINATION FOOT-CANDLES
.3
.2
.1
0
A
B
46771
100 FT.
120 FT. OR HIGH
SYSTEM | WATTS PER LINEAR FT. | AVE. F.C. | MAX. F.C. | MIN. F.C. | RATIO MIN./MAX.
A | 3.3 | .180 | .290 | .120 | .410
B | 3.3 | .090 | .140 | .053 | .380
HEIGHT OF UNITS 15 FEET.
A - FORM-8 NOVALUX ORNAMENTAL UNIT WITH 600 C.P. MAZDA SERIES LAMP; 3 SECTION STIPPLED GLOBE #95 HOLOPHANE PRISMATIC DOME REFRACTOR.
B - MONAX ORNAMENTAL UNIT WITH 600 C.P. MAZDA SERIES LAMP AND MONAX GLASS BALL 12" DIA.
ILLUMINATION CALCULATED ON STREET SURFACE ALONG CENTER LINE OF STREET
CALC. FROM C-46638-C-46767
TEST NO. 3516 ER
CHECKED BY
INSPECTED BY
JAN. 22-18
W. DA. RYAN
ILLUMINATING ENGINEER
ILLUMINATING ENG. LABORATORY
GENERAL ELECTRIC CO.
SCHENECTADY, N.Y.
C-46771

FIG. 6—ILLUMINATION ON STREET SURFACE.

of pleasing appearance and redirects into the street the upward light that otherwise would be wasted.

A ball globe 12 inches to 18 inches in diameter mounted on top of a pole has been used to a considerable extent for lighting residential districts. But, while the appearance is good, it is wasteful, as more than half of the total light is above the horizontal. Fig. 5, plotted from tests made at the Illuminating Engineering Laboratory of the General Electric Company, shows the candle power distribution curves of the two units under discussion with a 600 C. P. Mazda series lamp. This illustrates more clearly than words can tell the saving in light effected by the new unit.

The illumination on the street surface, along the center line, has been calculated from the distribution curves of the two units and is shown on Fig. 6. This shows the units on one side of the street only, but the result will be approximately the same if the units are staggered and also if the units are placed in a row along a parkway in the center of a boulevard. If they are arranged parallel, the values would be doubled.

For the sake of ready comparison the essential data and relative efficiency of the two units are tabulated in the accompanying table.

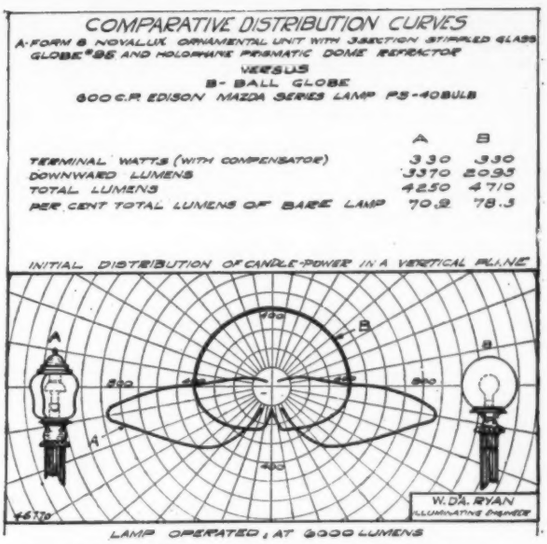

COMPARATIVE DISTRIBUTION CURVES
A-FORM 8 NOVALUX ORNAMENTAL UNIT WITH 3 SECTION STIPPLED GLASS GLOBE #95 AND HOLOPHANE PRISMATIC DOME REFRACTOR
VERSUS
B- BALL GLOBE
600 C.P. EDISON MAZDA SERIES LAMP P.S.-40 BULB
A B
TERMINAL WATTS (WITH COMPENSATOR) 330 330
DOWNWARD LUMENS 3370 2095
TOTAL LUMENS 4250 4710
PER CENT TOTAL LUMENS OF BARE LAMP 70.2 78.3
INITIAL DISTRIBUTION OF CANDLE-POWER IN A VERTICAL PLANE
W. DA. RYAN
ILLUMINATING ENGINEER
LAMP OPERATED AT 6000 LUMENS

FIG. 5—COMPARATIVE LIGHT DISTRIBUTION OF TWO TYPES OF GLOBES.

Comparison of Ball Globe and Form No. 8 Novalux.

	Data		Relative Efficiency	
	Form 8	Ball Globe	Form 8 Per cent	Ball Globe Per cent
Upward lumens	880	2,615	34	100
Downward lumens....	3,370	2,095	161	100
C. P. at 80 degrees....	880	400	220	100
Watts per linear ft....	3.3	3.3	100	100
Average F. C.....	0.18	0.090	200	100
Maximum F. C.....	0.29	0.140	207	100
Minimum F. C.....	0.12	0.053	226	100

From this tabulation it can be seen that the upward light with the Form 8 unit is only 34 per cent of that from the ball globe unit. The average illumination on the street surface with the Form 8 unit is double that with the ball globe unit. This means that fifty Form 8 units will give the same illumination as 100 ball globe units and consequently only one-half the energy will be required, or fifty Form 8 units will give twice the illumination of fifty ball globe units for the same energy consumption.

NEW FEATURES IN CONCRETE PAVEMENTS.*

Hand Roller and Canvas Belt—Eliminating Waves——Resurfacing with Concrete—Hydrated Lime—Expansion Joints—Measuring Aggregates.

In concrete road construction several new features have been devised in the last few years. Probably the one that is now demanding the widest attention is the use of a hand roller in finishing the concrete. It is stated that slabs finished with the roller develop considerably more strength than slabs finished by an ordinary float. Not only does the roller increase the strength of the concrete, but it is stated that it also takes out the short waves that cause considerable vibration to traffic in passing over the pavement. A common way of manipulating the roller is to move it transversely across the pavement a certain period after it is struck off with the template. The effect of the roller is to consolidate the top layer of the concrete and remove the surplus water and take out the slightly uneven places that have been left by the template. Experience will tell best the

*Part of paper before American Road Builders' Assn., by Chas. M. Upham, and discussion of same by W. M. Kinney.

right amount of rolling. After the pavement is rolled, it is ready to be finished with a canvas belt.

In riding over concrete roads it has been found sometimes that there is considerable vibration or unevenness. This is a serious objection which should and can be overcome. On roads that have been constructed for some time a good part of this is due undoubtedly to the fact that sufficient care was not taken in finishing. It has been found that, even with extreme care with the template and in hand floating, there are still numerous waves in the concrete surface, and it is stated that it is practically impossible to get rid of this. After experimenting with various finishes, it has been found that the smoothness and evenness of the surface are practically determined by the condition of the side forms. A form that keeps a true alignment and is not easily bent and can be kept in a straight line is the one that will produce the smoothest pavement. It would indeed be a new feature to produce a form that will stand up and remain in good condition under the handling given by the contractor.

A new feature in the maintenance of concrete roads is the use of a tar kettle upon which are mounted a pump and hose. Considerable time is saved by the pump and hose, and a large mileage of concrete pavement can be maintained in a short time.

Another new feature in concrete construction is the resurfacing of an old concrete road with a concrete surface. This is now familiar to all highway engineers, and has practically been accepted as being a satisfactory method of resurfacing.

In the construction of concrete roads, the use of hydrated lime has demanded considerable interest and attention. Many laboratories have done considerable experimenting, but for some reason have not written a great deal on this subject. It appears that hydrated lime does not have the same effect upon different proportions of concrete, nor does it have the same effect upon different sands. It also appears that the beneficial effects of hydrated lime are within certain limits. In connection with the sand used in Delaware, the maximum benefit resulted when four per cent of hydrated lime by weight of the cement contents was used. It appears from the results that lime is not as beneficial to the stronger or weaker mixtures of concrete as it is to the intermediate. In other words, hydrated lime is found to be beneficial to the strength of concrete when used within certain limits. The length of this paper being restricted, it will not be possible to go into the details of these tests.

It is not a new feature, and it is practically now accepted by all engineers that the aggregate in concrete should be mixed for at least one minute. Certain experiments seem to show that continued mixing increases the strength up to four minutes. It appears, however, that the most economic time is between one minute and one minute and a half.

The question of joints seems to be one that has demanded considerable attention and it is now almost the general method to place a joint only at closing of work for the day, or no joint at all. Many experiments have been carried out by making each day's work as one large slab without a limit to its length. While no bad effects have resulted from this, it does not mean that transverse cracks are eliminated entirely. Inasmuch as it seems practically impossible to eliminate entirely these transverse cracks, it is considered good practice to regulate and provide a place of weakness in the pavement by placing a blind wooden joint underneath the surface at intervals from 50 to 200 feet apart. This regulates the location of the transverse cracks to a certain extent and makes possible a straight line crack instead of an irregular one. As a word of caution, there is a danger in not getting the wooden joints vertical. This would have the tendency for one slab to rise above the next. One other method that seems to be satisfactory and will insure no possibility of one slab rising above the other is to tie the different slabs together by iron rods which have been coated with tar or asphalt. This allows the concrete to contract and re-expand, but will not let one slab rise above the other. In this case the joint is treated and maintained exactly the same as a crack.

The use of calcium chloride in concrete, while not exactly new, is one that is creating quite an interest. Sufficient data are not available to show the ultimate results this may have on concrete roads.

In the construction of concrete, a new feature that has greatly reduced the cost of construction and assisted in producing a more perfetc concrete road is the method of measuring the aggregates at the point of supply and carrying them to the concrete mixer in containers each holding one batch. Upon arriving at the mixer the concrete ingredients are dumped into the hopper in one operation and then mixed and placed in the regular way. This method does away with the placing of the aggregates on the subgrade, which would mean that considerable of the aggregate is lost and that the subgrade could not be kept in as good condition as with the central distribution method. It also means that the aggregates are kept much cleaner, which means that the finished concrete is so much better. It also means that the labor operation of loading the concrete ingredients from the subgrade into the hopper is entirely eliminated.

Several methods have been devised to carry out this system, but probably the most satisfactory one is the use of an industrial railway for hauling the containers which carry the aggregates to the mixer. The container is taken from the car and emptied into the hopper by means of a derrick attached to the concrete mixer.

In discussing this paper, W. M. Kinney, engineer of the Universal Portland Cement Co., cited a pavement laid in the Duluth plant of the cement company in which it was considered that dowels at the joints were absolutely necessary, and they were used successfully. In Commonwealth avenue, Duluth, they were made by using ⅜-inch rods set 12 inches apart. One end of each rod was tarred and the other end was left bare so that it could be held tight by the concrete in which it was set. After two winters, no differences in elevation at the joints had developed.

Concealed joints also are used successfully, made by placing a separating strip at least 3 inches below the top surface of the pavement. If the thickness of concrete above the strip is less than 3 inches, it is likely to spall off at the top at an angle, leaving a width of hole which makes it difficult to maintain the pavement.

As to variation in contour of concrete pavements, the committee of the American Society of Civil Engineers recommended that the variation in surface from a 6-foot straight edge parallel to the center line should not exceed ⅛ inch. There is no living contractor that can reach this requirement continuously. A pavement with not exceeding ¼-inch variation is difficult to find. A block of asphalt pavement which was considered to have a perfect surface had at least a half dozen places in which the variation was greater than ¼ inch. A bar has been built for testing rapidly and continuously the variations from straight edges of 2, 4 and 6-foot lengths; and this bar will be used for taking measurements on a number of pavements as soon as the weather permits.

Municipal Journal

Published weekly at

243 West 39th Street

by

Municipal Journal and Engineer, Inc.

S. W. HUME, President
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Sec'y

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Telephone, 9591 Bryant, New York
Western Office, Monadnock Block, Chicago

Subscription Rates.

United States and possessions, Mexico and Cuba.....$3.00 per year
All other countries..... 4.00 per year
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

Change of Address.

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributed Articles and Reports.

Contributions suitable for this paper, either in the form of special articles or as letters discussing municipal matters, are invited and paid for.

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ENGINEERING STUDENTS AND THE WAR.

We have received from Dean M. E. Cooley, of the College of Engineering of the University of Michigan, a copy of a letter from President Wilson which we print herewith. The President's letter came as the result of resolutions prepared by a committee of engineering educators. The letter is as follows:

THE WHITE HOUSE
Washington

My dear Dean Cooley:

I understand that there is to be a meeting of the department superintendents of the American Educational Association in Atlantic City on the twenty-fifth of next month. I would like very much to be present in person at that meeting, but since I cannot be, may I not ask you to express to the gentlemen assembled there my very great concern that none of the educational processes of the country should be interrupted any more than is absolutely unavoidable during the war.

My attention has lately been called in particular to the falling off in the number of engineering students and this has given me a good deal of concern, because it is not only immediately necessary that as many students as possible should prepare themselves for engineering duties in the Army and Navy, but it is also of the first consequence to the country that there should be an adequate supply of engineers for the period of reconstruction which must follow the war.

Not only has technical training become of enormous importance in military operations, but the role of the engineer has become more and more important in every process of our industrial life, and I hope that influences may go out from the meeting in Atlantic City which will call the attention of parents throughout the country to the importance of making any sacrifice that it is possible to make to keep their sons in the schools even during these trying times.

Cordially and sincerely yours,
WOODROW WILSON.

Commenting on this, Dean Cooley states that thousands of engineers are in France, there being from five to six thousand engineer officers in the army service early this year. The attendance at engineering schools has fallen off 25 per cent to 35 per cent and hardly a day passes without calls from the army or the navy for the services of members of the higher classes in the engineering schools, and the engineering graduates this year will probably be only half the usual number.

As a class, engineers are keen for active war service, and there will of a certainty be casualties among them. This, with the reduced number of graduates, will decrease the number of engineers after the war. But the demands for engineers to repair the destruction of war, to rejuvenate railroads, roads and plants worn out by the unusually strenuous service they are being called upon to render, and to catch up in general construction work that is being postponed because of the war's necessities, will be greater than ever before. The result will be a shortage of engineers and the use of improperly qualified ones that may be almost disastrous to ourselves and other nations that will look to us for help in their reconstruction activities after peace has been declared, unless immediate action is taken.

To meet the coming emergency, the engineering classes in our colleges should be doubled rather than halved. It is of the greatest importance that all engineering students remain to graduate who can do so, and that thousands of boys with engineering talent be persuaded to enter engineering schools.

There were excellent reasons for our being unprepared for war. We can see none why peace should find us equally unprepared.

THE INSTABILITY OF MUNICIPAL REFORM.

It is with real regret that we have recorded the death of Rudolph Blankenburg, former mayor of Philadelphia, the "War-Horse of Reform." For thirty years he fought in every bitter battle for civic decency against the intrenched forces of the autocracy of boss politics. He was a true civic sanitarian in his devotion to the task of disinfecting one of the worst festering political sores in the country. For four years, while he was mayor, the forces of right held power. Yet he lived to see those whom he opposed recover their hold on the city. Before he died the shooting scandals of the last primaries startled the city into a protest of outraged helplessness—and only a few weeks ago the United States government held his city up to the scorn of the nation as the worst vice spot in the country because "responsible city officials" are "in intimacy with those who profit by the continued existence of vicious conditions."

It has become a commonplace that no American municipality "stays reformed." University theoreticians and practical civic leaders are alike hurt and discouraged by the apparent hopelessness of the electorate in its inability to distinguish between right and wrong—its susceptibility to political change—its ingratitude.

Too often we all have mistaken book-keeping for revolution and a card index for basic reform of democracy. Eliminating graft, whether it is petty or gigantic, is a transitory fumigation. Installing a measure of scientific management in administration means only that the taxpayer's dollar will bring him a few more cents' worth of service. Experimenting with election machinery, inventing new brakes, governors and exhausts gives us a feeling of democratic power and a sense of efficient self-expression. Charter changes and new forms of government help sweep out some of the cobwebs and fungi of official routine. They serve to

focus authority and responsibility. But politics can work with few men as well as with many. We have had all these reforms in different cities at various times—they have been clutched by the voters like toys and then thrown away after a little while or else appropriated by the powers of evil for their own ends.

Much of what has appeared as reform has been but a raid on office by the politicians of the outside party and the citizens have been deluded into mistaking the brass band for a call to arms, the red fire for a torch and the campaign bunk for a crusade. And the leaders they have swept into city hall have shut the doors in their faces and they wait until next election day for the gang they had put out to lead them back again.

Disillusioned reformers say that the people do not know what they want—that they do not want good government. Perhaps the reason is that the people do not recognize good government when they see it. Is it because, when they have had a reform administration, it has had merely an appearance of goodness and has had no real effect on their daily lives? Or is it that the benefits have been real, but not pointed out to the citizens? If the second is the cause, then we have failed in the elementary task of education, we have not visualized good government. Perhaps, if we could convince the voter permanently that when he enters the booth he may be voting for life or death for his child, he would mark his cross in the right place. Perhaps we have not been able to prove to him that there is no such thing as Democratic sewers or Republican sidewalks—or that the tariff has nothing to do with the organization of the grade school.

But if good government is not a real thing, and voting is merely an annual amusement and does not mean anything, that is more serious. City government must then be accused of not touching us at the vital points of our lives, of being superficial, of being unintelligent.

They say democracy is a failure. The remedy is more democracy. They say that "we cannot change human nature." Perhaps the fault lies in our not understanding human nature.

Rudolph Blankenburg lived and is dead—and Philadelphia is still Philadelphia.

RECENT METHODS OF APPLYING BITUMEN.

In a discussion before the American Road Builders' Association, P. P. Sharpless, engineer of the Barrett Company, referred to some of the more recent developments in the use of tar and asphalt in road construction. Tar-and-gravel concrete had been mentioned as novel, but Mr. Sharpless said that Mr. Clark had used such concrete for years in Concord, grading the gravel and proportioning the tar by trial and arriving quite closely at the Topeka specification; much of the success probably being due to complete control by one man of the materials and proportioning, which, while not always the best according to modern notions, were varied to suit each other and produced very satisfactory results.

Where gravel is used for surface treatment, it must be properly selected. Maine and Massachusetts have used cold tar and gravel for some time, usually giving two surface treatments the first season. A gravel road is not generally uniform, and soft pockets show up which break the surface and which should be patched. If this breaking of the surface is due to frost, the road must be scraped and scarified and must usually be retreated also, though sometimes no retreatment is necessary.

The "tar-puddle" methods developed and applied by Shirley in Maryland and Hurst in Wisconsin are excellent, and yearly treatments are not necessary where they are followed. It is believed that this method was first used in 1910.

In Wisconsin there are soft sand districts where absolutely no road-making materials are to be found, and here the sand-hay road has been developed. The tough marsh hay used by farmers to make these roads possible soon rots and the roads go to pieces. The state highway commissioners have tried covering the hay with refined tar, then adding more hay with or without a layer of sand between. More tar is added on top of the upper hay layer, and then sand to smooth out the surface. The road irons out and becomes quite smooth and requires much less repair than those in which the tar is not used, and is passable for much longer periods.

The mixing method of using cold bitumen for cold patches or treatment is probably better than the penetration method, using either cut-back or emulsified tar. This method is valuable in city and suburban street work where traffic is light, as well as in maintaining country roads.

MALDEN FIRE DEPARTMENT ITEMS.

In his report for the year 1917, John H. Hannan, fire commissioner of Malden, Mass., mentions several improvements which were effected during that year. Some of the more interesting of these are as follows:

An acetylene welding and burning outfit was installed, which saves time, labor and expense, and enables the department to do itself a considerable amount of work which formerly had been sent to Boston.

The stock system has been installed and extra parts of the various pieces of apparatus are now kept on hand for emergency, which obviates the necessity of keeping cars out of commission while sending to the manufacturer's for spare parts. All hydrants in the city were painted, the high-pressure hydrants being given red tops and the low-pressure hydrants silver tops.

The number of alarms during the year was the lowest for several years past, which is attributed to the fact that the public had been educated by display advertising in the local papers and that rigid inspection was made of the yards of buildings and other hazardous places and dangerous locations.

During the year, four members of the fire department joined the army, one of them being in the service as first lieutenant and another as corporal.

TREATMENT OF INDIGENT SICK IN TOLEDO.

In our issue of April 6th, on page 286, we published a news item from Toledo, O., attributing to Joseph Kelsey, "Director of the Division of Health," the statement that "it is cheaper to pay railroad fare for sick and indigent to other cities than it is to take care of them." We have received from W. S. Johnson, secretary of the Commission of Publicity and Efficiency, a request to correct this item, which in justice to Mr. Kelsey we are only too glad to do. Mr. Johnson informs us that the statement referred to was made by Dr. C. C. Dreyer, former commissioner of health, in his annual report for 1917, and not by Joseph Kelsey (whose title, by the way, is Director of the Bureau of Public Health Instruction, a branch of the Division of Health). Mr. Johnson says that a probable explanation of the mistake is that our informant found Mr. Kelsey's signature at the end of the annual report, the report of his bureau being the last in the published report, and assumed that he was responsible for the entire report.

Very properly, it seems to us, Dr. Dreyer has been forced to defend himself from several severe criticisms for expressing the above idea, and has been removed from his position as head of the Division of Health.

The WEEK'S NEWS

Pennsylvania State Highway News—$2,000,000 Sewage Disposal Plant for Indianapolis—Buffalo's Housing Problem—U. S. Eliminates Typhoid and Dysentery from Army—The Marin, Cal., Municipal Water District Grows—Public Service Commission Has No Power to Raise Gas Rates in New York—Navy Department "Takes Over" Philadelphia Police in Vice Fight—Debt of California Cities—Municipal Information in Pennsylvania—Car Fare Regulation in Missouri—Seattle and Tacoma Vote on Municipal Railways.

ROADS AND PAVEMENTS

Highway Commissioner Indicted by County Judge.

Lock Haven, Pa.—Judge McCormick of Clinton county has ordered J. Denny O'Neil, state highway commissioner, indicted because of the condition of the state highways near Avis. The highway department has promised on numerous occasions to make the necessary repairs, but no action has been taken. A constable was sent to Harrisburg by the district attorney to serve a warrant on commissioner O'Neil. Commissioner O'Neil, when interviewed, said that he knew of no complaints from Clinton county and that plans are maturing for road repairs in that section. "As for indicting the highway commissioner for failure to repair roads," Mr. O'Neil said, "that was tested out during a former administration and was found to be illegal."

Road Contractors Must Hold to Bids.

Harrisburg, Pa.—Bidders on the state highway work and contractors generally have been informed that under the law the state will have to hold them to their bids and forfeit deposits. Recently instances have arisen where contractors have been awarded contracts who were unable to secure bonds and lost money deposits.

Railway Company Need Not Repair Settling Pavement.

New York, N. Y.—The appellate division of the supreme court has decided in favor of the defendant in the case of the city against the New York Railways to recover $2,161 for pavement repairs on Lexington avenue. The case involved the question of the duty of the railway to maintain pavement after temporary restoration following subway construction. In this instance, at the completion of the subway work, the contractors restored the pavement, but at the end of six months it had settled so that repairs became necessary. The city notified the company to repair the pavement in the railway area. The company refused to comply, contending that the contractors were responsible for the restoration of the pavement to its original condition. The decision is regarded as very important in New York, since most of the paving along the new subway lines is affected to some extent.

SEWERAGE AND SANITATION

Decide on Sewage Disposal Plant for Indianapolis.

Indianapolis, Ind.—Resolutions providing for the building at Seller's farm, which is situated southwest of the city, at the junction of Big Eagle Creek and White River, of a sewage disposal plant, at an estimated cost of $1,912,000, have been adopted by the board of sanitary commissioners of Indianapolis under the provisions of the sewage disposal law enacted by the last legislature. A public hearing has been held for persons affected by the resolution or those who are interested in it. The resolution states that the board has found that the water in White River is being polluted by the sewage from Indianapolis, and that a sewage disposal plant is necessary. Preliminary plans, maps, drawings and specifications have been prepared. Before the commission, however, can issue the bonds to raise the money for the work it must have the approval of the federal reserve board. Seller's farm contains 184 acres. On this farm is situated the garbage reduction plant of the Indianapolis Reduction Company. The sanitary commission is considering buying this plant, and if it is bought it will become a part of the sewage and garbage disposal system of the city. The estimate of the cost of the sewage disposal plant, as fixed by the sanitary board, is as follows:

Intercepting sewer and rights-of-way, $200,000; pumping station and suction well, $100,000; coarse screens, grit chamber and Venturi meter, $40,000; fine screens, $182,500; building and substructure for screens, $50,000; sprinkling filters, $900,000; settling tanks (2.4-hour retention), $160,000; sludge pumps and force mains, $10,000; concentrating tanks, $25,000; sludge pressing and drying plant, $140,000; main outside conduits and outfall, $75,000; administration building and laboratory, $15,000; water lines, $9,000, and lighting, $5,500; total, $1,912,000.

An enormous conduit will be constructed from a point near Wisconsin street, just west of Senate avenue, to pick up the sewage from the interceptors, which now empty into White River. The conduit will run to the Seller's farm, where the sewage will be treated and turned into fertilizer for commercial purposes. The present plans call for the pressing of the sludge and the selling of the product for fertilizer. Jay Craven, secretary of the board, has recently made trips to Milwaukee and Chicago, where he investigated the plants there where sewage is treated for commercial uses. The board of sanitary commissioners is composed of Henry W. Klausmann, city civil engineer, president; C. H. Hurd, vice-president, and Jay Craven, secretary. Application for permission to issue $200,000 worth of bonds for a garbage reduction plant has been made by the commission, and Samuel Ashby, corporation counsel, who went to Washington, reported a favorable decision from the federal capital issues committee.

Housing Conditions in Buffalo.

Buffalo, N. Y.—The sanitary inspectors of the health department recently completed a housing census which gives full knowledge of how every house in Buffalo is occupied. Buildings numbering 535 were found occupied by three or more families of which there was no tenement house record; consequently these buildings will be treated as unlawful structures occupied by more than two families in violation of the New York state tenement house law, unless the owner proves the building lawful. The inspectors also found several hundred buildings converted into rooming houses in violation of the city ordinances. The census shows the following:

One family houses	33,175
Two family houses	25,847
Tenement houses occupied by more than two families living independently of one another and doing their cooking upon the premises	4,309
Rooming houses	1,075
Lodging houses	50
Boarding houses	94
Hotels	76
	64,625

The census has shown quite conclusively that there are very few vacant houses or apartments in the city. Families have doubled up, others taking in roomers and boarders. One and two family buildings have been converted into unlawful tenement houses. These will be reduced by the department when orders are issued in accordance with the state tenement house law. Hotels, apartment houses, tenements, boarding, lodging and rooming houses are filled, and many private dwellings converted into rooming houses in violation of the city ordinances. These will be made to comply with the ordinances. Labor camps have been established by the railroads in various sections of the city to house their laborers. Houses have not been erected in

pace with the growth and increased population of the city. Only four tenement house plans were approved during the past year, with a total of 41 apartments. There is a big demand for small apartments within walking distance of the business section. The street railroad company's transportation facilities are not keeping up with the growth of the city to warrant development for housing people on the outskirts of the city.

The department's inspection service was reorganized during the year to improve the service and facilitate the work in general. Prior to this the work of sanitary and tenement house inspectors were constantly overlapping each other. Under the reorganization plan, the city was laid out into sixteen districts to harmonize with the Charity Organization and health center districts. The inspector is held strictly accountable for the sanitary conditions in his district and must be able to report on all violations of the state tenement house law, and also of the city ordinances.

Government Cuts Sewer Bond Issues.

Detroit, Mich.—More than half of Detroit's proposed $8,000,000 sewer building program cannot be carried out this year. The capital issues committee of the federal reserve bank will not approve more than $3,000,000 worth of sewer bonds, city controller George Engel has been informed. Practically the entire proceeds of these bonds will be needed to pay for the five sewers, for which bids already have been received. Men and materials needed for municipal improvements are considered by the issues committee more than is the money phase, according to Mr. Engel. There are bond issues amounting to about $15,000,000 in the 1918-1919 budget, all of which will have to be approved by the capital issues committee before they can be sold.

Erie to Build Creek Tube in Sections.

Erie, Pa.—Council has asked Farley Gannett, consulting engineer on the Mill Creek flood protection sewer, to prepare plans so that bids can be called for on the completion of one or more sections this summer. On the advice of Mr. Gannett council decided to complete the tube from 21st street to 28th street and at the outlet of the stream. This will be done in sections, and council will ask for separate bids on each division of the work. After completion of any section of the tube the city engineer will be directed to furnish a report covering its cost. The city will appropriate such money as it deems possible for the completion of the work. The court will be asked to appoint viewers to hear all reports of damage by adjoining property owners. All such damage will be settled by the city. The new ordinance embodying this action repeals all others dealing with the Mill Creek tube. Owing to the fact that council relet the Metz and Roth contract to the George Cantrell Company it is forced to ask that concern to waive its contract on those sections of the tube which the city decides to build. The city will appeal the decision of judge Rossiter, reported last week, to the state supreme court. City solicitor Gilson contends that judge Rossiter did not pass on "The city's right to let contracts on the cost plus basis and what is a sufficient appropriation for the work and if bonds are considered an appropriation for it."

Army Eliminates Typhoid and Dysentery Menace.

Washington, D. C.—Official figures given out at the office of the Surgeon General show that there have been but eight deaths from typhoid fever in army camps in the United States since Sept. 21, 1917. Dysentery has been stamped out for the first time since wars began. There has not been a single death from this cause and there are no cases now under observation. The records show that but a single suspected case of typhoid is under observation at present. The sick and death rates from this disease are so small as to be considered negligible. Reports by the Surgeon General's office show that during the Spanish-American war the death rate from typhoid was 8.79 per thousand. If that rate were effective today the American armies, on the basis of 1,500,000 men in the service, would have lost from 13,000 to 15,000 men because of the ravages of this disease alone. A campaign is now being conducted to prevent the outbreak of dysentery in the camps during the summer, and the officials are confident that it can be held in check. It is believed also that the danger of a large number of deaths from typhoid has been definitely averted as a result of the advanced methods adopted. Reports from abroad indicate that typhoid as well as dysentery has been stamped out of the overseas army as a result of the system of inoculation and the other sanitary precautions taken.

WATER SUPPLY

Municipal Water District Expands.

San Rafael, Cal.—The Marin municipal water district has voted to take over the Belvedere and Fairfax water systems and operate them as part of the big $3,000,000 project, which is rapidly nearing completion. This addition to the system means that municipal water is now being served to the residents of San Rafael, San Anselmo, Fairfax, Ross, Kentfield, Corte Madera, Larkspur, Mill Valley, Sausalito, Forts Baker and Barry, Angel Island, Tiburon, Belvedere, San Quentin, California City, McNear's Point and Lagunitas. The district paid $10,000 for the Fairfax distributing system of Frederick Croker, and $25,000 for that part of the Belvedere system taken over. The Larkspur and Corte Madera systems were added to the properties of the district about three months ago. The directors also decided to take over the Baltimore Park system of W. L. Courtwright as soon as the title can be transferred. This will give the district control of every water-serving property in Southern Marin County. The district's system will have cost $3,000,000 by the time it is completed this fall. A new reservoir is being built in Lagunitas canyon, with a concrete dam at Alpine, costing about $350,000, and which, it is claimed, will provide sufficient water for the district for the next twenty-five years. Work on the second unit of the new system, the Pine Mountain tunnel conduit, through which the new reservoir will be connected up with the present system, is nearly complete. Work on the concrete pipe line connecting up the reservoir with the tunnel has been commenced. General manager John Burt estimates that the entire system will be in operation this fall, in time to catch and store the winter's rains.

Poor Storage Records Cause Pipe Loss.

Detroit, Mich.—Dadson, Burnell & Co., accountants, have filed their formal report of their investigation of receipt and disposal of water pipe by the board of water commissioners from July 1, 1915, to December 31, 1917, in recorder's court, and the report states: "There is an apparent shortage of 510.27 tons of cast iron pipe of a value of $15,563.24, consisting of pipe, shown by the records of the board, to have been delivered to proposed water main locations, but not reported as laid, and yet unaccounted for." The report of the accountants is the sequel to judge William F. Connolly's grand jury inquiry into water board affairs, and besides listing the apparent shortage of water pipe of nearly all sizes the report sharply criticizes the handling of pipe and records at the storage yard of the water board. "The bookkeeping at the storage yard has been so poorly done as to make an accurate audit extremely difficult," the report states. "Few of the books and records of the storage yard examined were found to be reliable or accurate. The only records which could be verified with absolute accuracy were those relating to purchases of pipe. Invoices covering all purchases were readily accessible and in good order. The delivery tickets contain manifest errors; the transfer tickets do not represent all transfers made, and the stores ledger, purporting to account for material received and issued, contains many fictitious entries. The storage yard records are made up in such a slovenly and careless manner as to facilitate the possibility of undetected shortages. As the pipe issued by the storage yard has been so carelessly accounted for it will be

apparent that the charges made to individual jobs for pipe delivered are not dependable, and there is no assurance that material intended for jobs reaches the proper destination. Ordinarily there is no responsible person at the jobs to receive the material, and if the driver should deliver an occasional load to some junk dealer there is no certainty that the shortage ever would be discovered. We have been advised that duplicate deliveries sometimes have been made in instances where pipe was not found at certain locations to which it was supposed to have been previously delivered without investigating where it might have gone." At another point in the report the delivery ticket situation is handled in this manner: "Blurred, illegible and otherwise undecipherable delivery tickets might have caused some clerical inaccuracies in obtaining a total of deliveries, but could not possibly have accounted for the serious discrepancies in the results reached. It seems clear that the delivery tickets did not in all cases represent actual deliveries or fully account for returns to the storage yards, nor were these returns fully accounted for on foremen's transfer slips provided for the purpose."

City Reduces Water Rates for War Gardens.

Pocatello, Idaho.—E. F. Ferer, water superintendent, has inserted the following official advertisement in the local newspapers, announcing a reduction of 50 per cent. in rates for water used in war gardens:

"Water for war gardens from metered services. By order of the city council a reduction of 50 per cent for the first 20,000 gallons of water after the minimum 5,000 will be made for the use of war gardens and irrigation of lawns for five months, beginning with May. To be entitled to this reduction, sign application blank in person at the water office. Be prepared to give area of garden tract and area of lawn, lot and block number. No reduction will be allowed unless application therefor is made, signed and has been approved. The usual 10 per cent additional reduction if paid before the 20th of the succeeding month. It is requested that at the end of the season applicants return to the water office their copy of application, stating in detail the amount and value of crops raised. 'A garden for every family' is the slogan."

STREET LIGHTING AND POWER

Commission Lacks Power to Raise Rates.

New York, N. Y.—Because of the belief that it lacks power to authorize an increase in the rates of a public service corporation above the maximum fixed by law, the state public service commission for the first district dismissed the application of the Bronx Gas and Electric Company for permission to raise its charge for gas from $1 to $1.50 per thousand cubic feet. Should the company appeal, efforts will be made to have the court of appeals pass upon the matter before the summer. The matter especially affects the gas companies in this city, because the maximum fixed by statute for gas, except in a few isolated instances, is 80 cents, a rate which every gas company has declared to be far below the actual cost of manufacture. The commission believes the companies should be permitted to charge a rate high enough to insure efficient service, and its opinion, prepared by commissioner Whitney, quotes from a decision of the appellate division, which said that "reasonable prosperity is necessary to reasonable service." In its application the Bronx company stated that the manufacture of gas now costs $1.14 a thousand cubic feet and that within a short time the cost will be $1.20. Similar figures have been submitted to the commission by some of the other companies. "If the commission is required and expected by the legislature," Mr. Whitney's opinion says, "to regulate all phases of the operation of a gas corporation such as this petitioner, dictate its service, compel its conformance to standards of quality, purity, and pressure of gas; prescribe its accounts, supervise its depreciation reserve, require the upkeep of property, and otherwise control the factors which determine its aggregate expenditures and influence largely its operations, is it to be expected that the legislature has left the commission powerless to secure to the company the reasonable revenues requisite for the fulfilment of the statutory purposes and the company's compliance with the regulatory orders? The presumptions would seem to be strongly against an intent to create any such one-sided plan of public regulation, a plan which commands the commission to require the companies to do various things to serve the public, yet withholds from the commission power to obtain for the companies the revenue necessary for the doing of those things." The commission refers to the enactment of the eighty-cent gas law in 1906, when normal conditions prevailed throughout the country and materials and the service of men could be obtained at a much lower cost than is now possible. It believes that the eighty-cent law, created after a long and fierce contest before the legislature, and another similar contest in the courts, was intended only to run as an experiment for an adequate number of years, and it says that this contention was upheld by the supreme court of the United States. Having enacted the law with much difficulty, the opinion says, it was considered as a measure of public policy, and that it was thought unwise therefore to place in the hands of the commission the power to overturn it. Attention is called to the recent opinion of Charles E. Hughes, who was governor when the public service commissions law was enacted, to the effect that the commission lacked power to increase a rate over the maximum fixed by the law. The charge of $1 made by the Bronx company was fixed by a special act, and the commission has reported that the company has conformed to the regulations of the commission and that on the whole its service has been "efficient and progressive." The opinion refers to recent decisions of the commission and of the courts dealing with the jurisdiction of the commission in the matter of rates of all utility companies. Section 66 of the public service commissions law, which relates to street railroads, provides that the commission may fix a rate, but the court of appeals recently decided that it did not have this power when a franchise or an agreement called for a fixed rate unless the local authorities first modified the arrangement. If the courts find that the commission has the same power to increase rates over the legal maximum as to lower them it is likely that all of the gas and electric companies in this city will file applications for relief.

Vote in Favor of Municipal Lighting Plant.

Redding, Cal.—Redding has voted almost three to one in favor of a municipally-owned lighting system. The vote for issuing $40,000 worth of bonds for that purpose was 744 in favor and 254 opposed at the recent election.

City Meets Company's New Rates with Old.

Marshalltown, Ia.—Notified that the Iowa Railway and Light Company intended to put in effect new and advanced rates for electric light and gas by May 1, the city council, at a called meeting, passed ordinances reestablishing the present rates for gas and electric current for lights, and added a penalty to each for violation. The ordinances are copies of the rate clauses of the original ordinances, the five-year periods during which those rates were effective having expired Sept. 1, 1917, and Jan. 1, 1918. The ordinance became effective April 14. The city now expects that the public utilities company will go into court in an effort to have the city enjoined from enforcing the ordinances. If that step is taken, as it probably will be, it will be the first move in what probably will be a lively legal contest over the rates for service. The penalty clause added to the ordinances provides for a fine of $100 for violation. The electric power ordinance rates run for twenty-five years from the date of the original ordinance, and are not affected by the present controversy. The new gas ordinance fixes the rates at $1 per 1,000 cubic feet, with the proviso that an additional 10 cents per 1,000 cubic feet may be charged customers who do not pay their bills within ten days after presentation. The electric ordinance for residences fixes 12 cents per kilowatt hour per fifty watt lamp for the first one-half kilowatt hour per month per lamp, and 7 cents per each kilowatt hour per month in excess of one-half kilowatt hour and up to one and one-half kilowatt hours per month per lamp, and 5 cents per kilowatt hour for all consumption in excess of one and one-half kilowatt hours per month per lamp. A discount of 10 per cent for payment within ten days of the date of render-

ing the bill is provided for. The rate for commercial lighting is the same with the exception that the 12 cents rate runs up to one kilowatt, and the 7 cents rate from one to three kilowatts and the 5 cents rate for all consumption in excess of three kilowatts per lamp per month. A discount of 10 per cent is provided for prompt payment, and for installation in excess of 25 lamps and consumption in excess of four kilowatts per month per lamp an additional 20 per cent discount is fixed. A list of questions prepared for the city and submitted to the Iowa Railway and Light Company at Cedar Rapids were not answered. These questions had to do with the price paid for the local plant, the price at which it was turned into the Iowa Railway and Light Company, and other interrogations bearing on the question of the amount of the investment in the local property. Vice-president John A. Reed replied that the city could ascertain the answers to these questions by an engineer's appraisal of the property. The city was then notified that the company would put new rates into effect with the issuance of the bills for the April accounts. To forestall this move the city council at once passed the ordinances re-establishing the old rates.

Indiana Commission on War-Time Utility Needs.

Indianapolis, Ind.—In its decision on the case of the Greencastle local Phoenix Telephone company, the state public service commission discussed its view of the need of the utility companies of the state in the following terms: "These are war times and the commission has time and again emphasized the proposition that it would not guarantee normal dividends to utilities during the period of the war. The utility must bear its share of the war's burdens, just as every other person and institution must bear its share. Even if it were necessary for the officers of the company to forego a portion of the usual salaries which they are receiving in order to pay a portion of the increased costs of operation, this would be a much more equitable solution of the problem than an increase in the rates. The commission is not unheedful of the fact that much has been said recently as to the necessity of carrying our public utilities through the war period. The commission is keenly alive to the point thus emphasized by secretary McAdoo, and has laid down the fundamental proposition that it will grant a full measure of relief whenever necessary to prevent injury to the business or interests of utilities. But certainly the statements above quoted are not to be interpreted as meaning that state and local authorities should, during the period of the war, guarantee to utilities the full or excessive profits of peace times. In several cases before the commission it has developed that utilities have built large and valuable properties out of earnings and that the profits in the years preceding the war were in excess of what would have been considered reasonable profits under the regulatory system. Now when war conditions have arisen and the large profits of the past have decreased, the utility will feel that it has just grounds for asking increased revenue. The commission, of course, cannot concur in such a conclusion."

FIRE AND POLICE

Big Fire in Oil Plant.

Cambridge, Mass.—With hard work and unhampered by a wind the Cambridge fire department stopped the spread of a blaze that caused damage of probably $100,000 in the oil storage plant of the Alden Speare's Sons Company. The firemen carried the fight into the heart of the blaze, with barrels of oil flaming on all sides. A general alarm was given, and within an hour the fire was subdued. The fire began in a backfire in an automobile truck that carried a large tank of road oil and which was about to start from the company's yard. The oil-soaked body of the machine caught and in an instant the contents of the tank were ablaze. The driveway on which the burning auto stood is flanked by storage buildings, and adjoining this is a yard where hundreds of barrels of oil lay on the ground. Each building was also filled with oil in barrels. At the farther side of the shed a railroad tank car filled with oil was standing on the Grand Trunk tracks. Farther back in the yard are two tanks, each of which contains 30,000 gallons of oil. By hard work the firemen kept the flames from these and also from the tank car. The heat from the burning automobile communicated to the buildings at either side and also to some of the barrels on the ground, and the flames spread rapidly. Two heavy explosions signalled the start of the blaze, and from that time on there were innumerable slight explosions as the barrels blazed up. The fire started just after twelve o'clock, when practically all of the employees were at dinner. When the first apparatus arrived a column of smoke and flame was twisting high in the air. So intense was the heat that sheets of the corrugated iron were melted away. The firemen were fortunate in that the blast from the burning oil carried the smoke skyward, and thus they were not hampered. The firemen attacked the blaze on both flanks, as well as from the front. The plant of the Galena-Signal Oil Company, a subsidiary of the Speare company, adjoins the section where the fire was at its worst, but was saved. In the immediate vicinity are the gasoline and road oil storage plants of a number of companies. On the way to the fire engine 7, a motor-driven piece of apparatus, collided with the horse-drawn hose cart of engine 4. The engine was towed back to quarters. No one was injured.

Federal Government "Controls" Philadelphia Police.

Philadelphia, Pa.—The United States has taken over the active direction of the entire police force of Philadelphia. Captain William B. Mills, head of the traffic squad, is now in control of the police, and is responsible only to Lieutenant-Colonel Charles B. Hatch, who represents the Navy Department. Superintendent of police James Robinson was slated by the mayor for a vacation, "which will last as long as he wants." These announcements followed a series of stormy conferences between Lieutenant-Colonel Hatch and mayor Thomas B. Smith. These developments marked the end of the week in which Secretary Daniels gave Philadelphia to wipe out vice resorts on penalty of establishing federal vice zones, which virtually would sweep out the saloons of the city. Captain Mills will be known officially as assistant superintendent of police, but he will be permitted to issue and sign orders unhampered by William H. Wilson, director of public safety, or by mayor Smith himself. He is responsible only to the federal representatives of Lieutenant-Colonel Hatch. In a statement Lieutenant-Colonel Hatch refused to say that the government had "commandeered" the police force in the full meaning of that word. He added, however, that the government was determined to clean up the city if the police could not do so. He said that, in addition to the police changes effected, sixteen enlisted men would continue to operate with six secret service men in checking up vice conditions here. He said: "Captain Mills had military training, and I believe he will clean up the city. Mayor Smith gave me his word of honor that Captain Mills will be unfettered and that he can promote and demote men as he sees fit. I told Captain Mills he is acting for the government and that I will back him up in everything he does so long as he is not fettered. Captain Mills told me that forty-eight hours after he takes control he would show that he is in absolute charge of the police department. I am acting for Secretary Daniels, and he has no desire to take control of the police here out of the hands of the municipal authorities. We intend to see, however, that the young men in the service are protected and that evil resorts are wiped out. I believe that conditions at present are good, and all we want to see is that they remain good. Our investigators will keep in constant touch with the situation, and our reports will go to Washington." Lieutenant-Colonel Hatch unequivocally rejected the proposal made by mayor Smith and director Wilson that the authority in the police force be divided between Mills and Robinson. He asserted that the federal government was dissatisfied with the attempts which superintendent Robinson had made to suppress vice, and that the one man in Philadelphia who was acceptable to the government was the head of the traffic squad. Mayor Smith said: "I am glad that we are out of this vice crusade. The government

has commandeered the entire police force of Philadelphia, and since the government has taken that step I bow to the United States government." Captain Mills said, however: "There is no truth in the statement that the United States government has commandeered the bureau of police. There is a perfect understanding between director Wilson and myself, and I have been given by him full power and control over the entire bureau, and I am answerable to him for every official act." A special fight will be waged against politics in the force, and a beginning was apparently made when the mayor reorganized the police trial board, dividing appointments equally between the two political factions. There were also a number of shifts in assignments.

Within a day after Mills took charge hundreds of habitues of the tenderloin district had left the city. Acting under the first orders of Captain Mills the captains and lieutenants were told they would be held to strict accountability for their divisions and districts, and they shut down the lid at once. Freed from political influence and given a free hand for the first time in years the captains and lieutenants knew exactly what to do. They went to their station houses and consulted the list of suspected places on file and compared them with supplementary lists. Then orders were issued to the policemen on the various routes to notify the suspected places they must close. At a conference with the officers Captain Mills said: "Discipline of the kind I demand can be obtained only by a complete severance of all fetters on the police, either political or personal. Get out of politics, pay no political assessments, forget your friends who want political favors and do only police work if you wish to hold your jobs. This is my first order and it will not be repeated. To emphasize my position let me say to you that in the future the recommendation of a politician will be a handicap rather than an aid to any policeman either seeking promotion or who is in trouble as a result of violation of orders. Responsibility for police work will reach from the patrolman on the beat all the way up the line. Remember, orders will be issued once; there will be no reminders. I have placed the responsibility for the conduct of the forty-two police districts upon the lieutenants. For the five police divisions the captains will be held responsible." The latest statement of mayor Smith was: "I have every hope he will make good, and the arrest of those who persist in running gambling houses and other illicit places will come as a matter of course. The time has passed when a gambler or protected vice of any sort is an asset to a political organization. Rather, indeed, are they poor liabilities."

Firemen Ask for Minimum Wages at Referendum.

San Jose, Cal.—The firemen have succeeded in obtaining more than the necessary number of signatures to their petition asking for a vote on May 6 on the proposition to have their pay increased from $80 to $100. They advertised their case in the local newspapers as follows:

VOTERS OF SAN JOSE, DID YOU KNOW THAT SOME SAN JOSE FIREMEN

Receive less than 89 cents for eight hours' work, or only $80 per month?
That they work 24 hours a day?
That they are away from their wives and families 313 nights each year?
That they cannot go over 100 feet from the fire house at any time only when off duty one day a week?
That they must answer every down-town alarm whether on duty or off duty?
That they spend nearly half of their meal hour (just granted by the State) going to and from their meals?
That they cannot go to the doctor or dentist unless they lose six hours' pay?
That they cannot go to church on Sunday or any other time.
That they are denied the companionship of their family and the comforts of a home?
That their entire life is one of loneliness equal to imprisonment?
Under these conditions will you give them a living wage?

Thirty-six Die in Institution Fire.

Norman, Okla.—Feeble-minded and demented boys numbering thirty-six lost their lives in a fire which destroyed three ward buildings of the state asylum here. Unconscious of any danger the boys stared blankly from their cots at the smoke and flames that were quickly enveloping their ward, and the pitiful pleadings of workers at the institution who fought the flames could not make the inmates realize what was happening. Rescuers were forced to drag or carry to safety those that were taken from the building alive, 125 being carried to safety. Dr. B. W. Griffin, superintendent of the institution, was one of the first on the scene following the sound of the alarm. He, with the aid of asylum employees and interns, bravely risked their lives to save the boys. A strong early morning wind fanned the blaze, which originated in the linen room from an unknown cause. The boys' ward was adjoining, and the flames enveloped the building so quickly that the structure collapsed before the rescuers had time to carry many to safety. Several of the workers were overcome by smoke and slightly injured by falling timber. It was not long before the building collapsed. The buildings destroyed were frame structures.

GOVERNMENT AND FINANCE

Indebtedness of California Cities.

Sacramento, Cal.—According to John S. Chambers, state controller, the total bonded indebtedness of the state government of California and the cities of the state for the fiscal year ending last June, and which will be shown when his annual report is printed and distributed, is $237,948,463.51. The interest paid in 1917 was $11,315,452.02. The bonded indebtedness of the cities as now outstanding is $139,451,711.68; of the counties, $64,003,251.83, and of the city government, $34,493,500. In addition the state has on hand bonds unsold in the sum of $28,875,000. During 1917 the cities voted down bond issues in the sum of $4,858,500 as against rejections in 1916 totaling $12,679,500. The bonded indebtedness of the cities increased in 1917 $11,539,520.05 as against an increase in 1916 of $16,466,728. Controller Chambers, in his report, as in previous reports, has urged the necessity of short-term, low-rate serial bond issues as against the long-term, high-rate bond issues of the past. He asserts that the people of California have gone "bond crazy," and declares that future issues should be held to matters of the first importance, which would impose too heavy a present burden if undertaken by direct taxation.

City Need Not Pay Taxes on Abandoned Dam.

New York, N. Y.—By the report of referee J. W. Boothby, New York city wins a ten years' court fight with the assessors who tried to tax an abandoned dam under thirty-six feet of water in Croton Lake and raised the question as to when a dam is not a dam. The dam was constructed eleven years ago. The report favors exempting the old dam from local taxation and reduces the assessment on flooded land, the total saving to the city amounting to $75,000.

City Officials Must Give Information Free to State.

Harrisburg, Pa.—City and borough officials are required to furnish any information asked of them in accordance with the law creating the bureau of municipalities of the department of labor and industry, and for such services they are entitled to no pay, is the decision of deputy attorney general Emerson Collins in reply to a question raised by Lew R. Palmer, acting commissioner of labor and industry. To comply with the law the information must be requested by the chief of the bureau who is J. Herman Knisely. The opinion is the result of certain city officials declining to furnish data to the state without being paid for their services, and the effect will be to place promptly in the hands of the bureau of municipalities, formerly the bureau of statistics and information, the required data. The opinion distinctly limits the law to cities, but while country or township officers are not compelled to give information on request without extra pay, Mr. Collins says that "it will no doubt be found in the public interest these latter officials will furnish the bureau with any desired information without charge. After quoting the provisions of the law, Mr. Collins says: "The conclusion is clear that the duty rests on city and borough officials throughout the commonwealth to furnish any information that may be required of them under and in accordance with the provisions of the said act, and that since the act makes no provision for compensation—they are entitled to none."

TRAFFIC AND TRANSPORTATION

Commission Asserts Power to Regulate Fares.

Kansas City, Mo.—The state public service commission at Jefferson city has handed down an informal decision in which it asserts that it had jurisdiction to regulate the rate of fare for street railway service. The decision followed a hearing at which briefs were submitted by the Kansas City Railways and the city. The city claimed that the franchise of the railway explicitly provided for five-cent fares, and that the city alone had power to change this provision. Many citations were made by the railway to show that the public service commission, even without the authority explicitly given by the act creating it, would have power to regulate rates as against the authority of a city which granted a franchise to the railway. The ruling of the commission grew out of the request of the Kansas City Railways to the public service commission of Kansas for increased fares. The company has a franchise in Kansas City, Kan., with seven years to run. It is probable that one or more joint meetings may be held by the two state commissions, during the progress of their consideration of the petitions now before them.

Voters Disapprove Municipal Railway Ownership.

Tacoma, Wash.—At the recent primaries the voters considered a referendum on the proposal to issue bonds for the purchase of the street railways owned by the Tacoma Railway & Power Company. The plan was voted down, four to one. The bond issue was to have been for $5,200,000.

Cleveland's Transit Commission Held Legal.

Cleveland, O.—The state supreme court has handed down a decision in which it upholds the legality of the ordinance providing for the appointment of a rapid transit commission and the construction of a subway in this city. The commission proceeded to request a bond issue of $100,000 to provide funds for preliminary investigations and engineering work. The members of the commission are Charles A. Otis, M. A. Bradley, C. E. Adams, street railway commissioner Fielder Sanders and finance director Neal.

Vote Funds for Municipal Railway Construction.

Seattle, Wash.—At the recent city election the transfer of bonds amounting to $350,000 from an original bond issue of $800,000, for the construction of a double-track municipally owned and operated elevated railway on certain streets was approved by the voters. The line is expected to provide at least a partial solution of the congestion problem in the industrial district and give increased transportation for shipyard workers. Work will progress immediately, and it is expected that the line will be completed within less than six months. Of the $800,000 bond issue authorized for the construction of the Seattle municipal street railways, $425,000 has been used to date.

All Forces Unite on Pittsburgh Valuation.

Pittsburgh, Pa.—A commission consisting of five engineers, one representing the city of Pittsburgh, one representing the boroughs surrounding the city, two representing the Pittsburgh railways, and the fifth, the chairman, representing the state public service commission, has been appointed to direct a valuation of the property of the Pittsburgh railways. This follows the decision of the commission in connection with the case against the railway growing out of the new fares put into effect in January. The members of the commission are as follows: F. Herbert Snow, chairman, chief engineer of the public service commission; Robert M. Feustel, member of the firm of Sloan, Huddle, Feustel & Freeman, consulting engineers of Chicago and Boston, representing the city of Pittsburgh; George Warren Fuller, New York, member of the firm of Fuller & McClintock, representing the boroughs; Morris Knowles, Pittsburgh, chief engineer in charge of housing for the United States shipping board, under whose direction the filtration plant at Aspinwall was built, representing Pittsburgh railways; J. A. Emery, New York, appraisal manager of Ford, Bacon & Davis, representing the Pittsburgh railways. It is understood that the members of the commission will confer regularly on two days of each week.

LEGAL NOTES

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

County Highway—Dedication.

Washington.—If dedicatory grants to county of highway, embodied in papers filed by landowners in statutory proceding to open highways, contained particular descriptions of land for road, nothing more was necessary to complete dedication than acceptance by county authorities or public, regardless of whether there was formal statutory establishing of roads.—Horton v. Okanogan County, 168 P. 479.

Water Supply Outside City—Discontinuation—Estoppel.

(Ga.) Where city engages ultra vires in supplying water to customers beyond its limits their improvement of their property in expectation of water main did not estop city from discontinuing service and removing water pipes.—City of Gainesville v. Dunlap, 94 S. E. 247.

Public Street—Recognized Private Claims—Estoppel.

(Utah) City held estopped from claiming as public street premises lying without 66-foot width of street, as shown on map filed with city council for approval by claimants of property, plaintiff's predecessors, city attorney and council having approved claimant's title, and city having possessed land for taxes.—Wall v. Salt Lake City, 168 P. 766.

Highway Improvement—Assessment Methods.

(Wash.) Highway Law (Rem. Code 1915, §5879—10), providing for assessment of land for highway improvement by a combination of the zone and area methods of assessment, is not arbitrary or made upon a fundamentally wrong basis.—Lindstrom v. McMillan, 168 P. 463.

Change of Highway Grade—Right of Way—Damages.

(Tenn.) Where plaintiff with others had obtained a prescriptive right of way across land to a public highway and there was no other egress to the public road, she was entitled to damages from the county for an obstruction of such road by the lowering of the grade of the main road.—Morgan County v. Goans, 198 S. W. 69.

Paving Blocks—Sale—Count—Indemnity.

(N. H.) Where the seller delivered paving blocks, stating the quantity, and the purchaser did not count them, but returned the bond, indemnifying it against breach of the contract, the obligor was not thereafter liable when the seller's count was found to be incorrect; the bond not being to secure accuracy of count.—Winslow v. Anderson, 102 A. 310.

(N. H.) The obligator on a bond indemnifying purchaser of paving blocks against breach of the contract is not liable thereon on mere showing of shortage in the number of blocks without evidence of damage.—Winslow v. Anderson, 102 A. 310.

Occupation Tax Prohibitive—Detrimental Occupations.

(N. M.) The ordinary useful occupations may be taxed, but the tax must be so laid as not to be prohibitive of the business, which rule does not apply to occupations detrimental to public welfare, but nevertheless tolerated.—Stalick v. Town of Gallup, 168 P. 707.

Ordinance—Failure to State Emergency.

(Tex. Civ. App.) San Antonio ordinance of August 27, 1917, regulating automobiles used for hire, is not invalid for failure to state, either in preamble or body, the existence of an emergency.—Craddock v. City of San Antonio, 198 S. W. 634.

(Tex. Civ. App.) The requirement that the title of an act shall embrace its subject does not apply to municipal ordinances.—Craddock v. City of San Antonio, 198 S. W. 634.

NEWS OF THE SOCIETIES

CALENDAR OF MEETINGS.

April 26, 27.—AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE. Annual meeting, Philadelphia, Pa. Secretary, J. P. Lichtenberger, University of Pennsylvania, Philadelphia.

May 7-9.—NATIONAL FIRE PROTECTION ASSOCIATION. Annual meeting, Chicago, Ill. Secretary, Franklin H. Wentworth, 87 Milk St., Boston, Mass.

May 7-10.—CANADIAN GOOD ROADS ASSOCIATION. Annual road congress. Secretary, George A. McNamee, 909 New Birks Bldg., Montreal, Que.

May 13-17.—AMERICAN WATER WORKS ASSOCIATION. Annual convention, St. Louis, Mo. Secretary, J. M. Diven, 47 State street, Troy, N. Y.

May 14.—AMERICAN ASSOCIATION OF ENGINEERS. Fourth annual convention, Chicago, Ill. Secretary, A. H. Krom, 29 South LaSalle St., Chicago.

May 15, 16.—SOUTH DAKOTA ELECTRIC POWER ASSOCIATION. Annual convention, Carpenter Hotel, Sioux Falls.

May 15-22.—NATIONAL CONFERENCE OF SOCIAL WORK.—Annual conference, Kansas City, Mo. Secretary, William T. Goss, 315 Plymouth Court, Chicago, Ill.

May 21-23.—ARKANSAS ASSOCIATION OF PUBLIC UTILITY OPERATORS. Annual convention, Hot Springs, Ark.

June 4-6.—INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS. Annual convention, Chicago, Ill. Secretary, Chief James McFall, Roanoke, Va.

June 4-7.—AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Spring meeting, Worcester, Mass.

June 13, 14.—NATIONAL ELECTRIC LIGHT ASSOCIATION. Annual meeting, Hotel Traymore, Atlantic City, N. J. Secretary, T. C. Martin, 33 West 39th St., New York City.

June 24-26.—AMERICAN CONCRETE INSTITUTE. Annual meeting, Atlantic City, N. J.

June 25-28.—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J. Secretary-treasurer, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

June 26-28.—AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Annual convention, Atlantic City, N. J. Secretary, F. L. Hutchinson, 33 West 39th St., New York City.

Northwestern Society of Highway Engineers.

Harmonization of the road laws and policies of Washington, Oregon, Idaho and Montana for better results and raising of the standard of highway engineering were among the principal subjects discussed by the delegates attending the meeting of the Northwestern Society of Highway Engineers, which held a two-day session—April 12 and 13—in Seattle.

Oregon engineers organized the society on April 9, 1917, at Portland, and this was their annual convention. It was primarily a "get-acquainted" meeting of the highway builders.

At present the organization has 136 members — eight from Washington state, two from Idaho and five from Montana. The other 121 members are from Oregon.

State highway commissioner James Allen told of obstacles met and overcome in this state by his department. He stated, among other things, that the state of Washington has at present 3,200 miles of roads, one-half of which are improved.

Commissioner Allen was followed by councilman R. H. Thompson, prominent in Northwest engineering circles, who suggested the naming of a committee by the association, to be vested with the power of disbarring members who did not honorably practice their profession.

Engineer C. B. McCullough, professor of civil engineering, Oregon State Agricultural College, in the King County commissioner's quarters, gave a lecture on bridge construction, illustrating on a screen the principles of construction of the large bridges in Oregon. Saturday night a banquet was held at the Seattle Hotel, and a trip to Camp Lewis was enjoyed by the visiting engineers the next day.

American Institute of Electrical Engineers.

The local sections of the American Institute of Electrical Engineers discussed a number of interesting papers during this month: "Electrification of Railroads in Its Relation to Communication Lines," by H. S. Warren, before the Philadelphia section, April 8; A. E. Bauhan, station superintendent Pennsylvania Water Power Company, on "Power-Station Operation and Maintenance," before the Baltimore section, April 12. At Pittsfield, Mass., A. C. Crehore, "Modern Consumption of Matter and Energy," April 11; Ann Arbor, Mich., Professor J. C. Parker, "Hunting," April 12; Boston, Stephen Hayes of the Westinghouse Electric & Manufacturing Company, "European Electrical Business in War Times"; Los Angeles, J. C. Ward, superintendent of generation of the Southern California Edison Company, "Fuel Oil Conservation," April 9; Toronto, Paul Ackerman, "High-Tension Insulators from the Operating Viewpoint," April 19.

North Carolina Health Officers' Association.

The North Carolina Health Officers' Association recently held its eighth annual meeting at Pinehurst. A feature of the session was a visit to the State Sanatorium for Tuberculosis, the members going through the country in automobiles, as guests of Pinehurst and Southern Pines. Following the reports of the various county health officers the sanatorium was inspected under the guidance of the superintendent, Dr. L. B. McBrayer.

Two things were particularly emphasized in the papers presented and the discussions. These were the imperative need of educational work along health lines and the problems that are accentuated by the war. The retiring president, Dr. D. C. Absher, presided, clad in olive drab, he being in active service as a lieutenant in the Medical Reserve Corps. There were several others in uniform present.

Following the annual address of the president and the report of the secretary and treasurer papers were presented by Dr. Miller, of the United

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PROBLEMS CITIES ARE STUDYING WITH EXPERTS

West Park, O., is constructing SEWERS. E. H. Arnold prepared plans and specifications for the work.

Kenilworth, N. J., is considering the installation of a new SEWAGE TREATMENT PLANT. N. M. Looney is the engineer for the proposed work.

Paulsboro, N. J., is to contruct a SEWAGE DISPOSAL SYSTEM after the preparation of plans by the consulting engineering firm of Remington & Vosbury.

Jacksonville, Fla., is to contruct a BRIDGE at a cost of $950,000. Preliminary plans for the structure are in course of preparation by the engineering firm of Harrington, Howard & Ash.

Santa Barbara, Cal., is receiving bids for the construction of a DAM. Plans and specifications for the structure were prepared by the consulting engineering firm of Quinton, Code & Hill.

Oskaloosa, Ia., is to vote on a proposition to issue $400,000 bonds for WATERWORKS. The consulting engineering firm of Burns & McDonnell has prepared plans for the plant.

Northampton, Pa., is to make STREET IMPROVEMENTS according to plans prepared by the engineer, L. J. H. Grossert.

Burford, Ont., is to contruct two reinforced concrete BRIDGES. The engineers for the work are the firm of Jackson & Lee.

A new FILTRATION PLANT is to be built by Auburn, N. Y. The consulting engineers for the improvement are the firm of Hazen, Whipple & Feller.

York and Cumberland counties, Pa., are to build an inter-county BRIDGE according to plans being drawn by the engineer, Charles A. Williams.

A reinforced concrete ROAD is to be built by Butler County, Butler, Pa. Plans and specifications for the work were prepared by the Farris Engineering Company.

New Toronto, Ont., is to build a FILTRATION PLANT to cost about $40,000. The engineering firm of James, Loudon & Herzberg is responsible for the plans and specifications for the work.

INDUSTRIAL NEWS

Cast Iron Pipe.—Government prices remain constant. Quotations: Chicago, 4-inch, Class B and heavier, $57.30; 6-inch, $54.30. New York, 4-inch, Class B and heavier, $58.35; 6-inch, $55.35; 3-inch, $65.35. Birmingham, 4-inch, Class B and heavier, $52; 6-inch, $49; Class A $1 extra.

Du Pont Photograph Contest.—To increase the interest in Du Pont products and to secure suitable photographs to illustrate the advertising and publicity of their various companies the Du Pont American Industries offer $500 in prizes for the fifty best photographs. The prizes are as follows: First prize, $100; second prize, $50; two third prizes, $25 each; fourteen fourth prizes, $10 each; thirty-two fifth prizes, $5 each. The photographs have to illustrate the following subjects, and be submitted before September 1, 1918: Agricultural Uses of Explosives; Fabrikoid (Artificial Leather); Industrial Uses of Explosives; Painting; Trapshooting and Hunting; Miscellaneous. Further details and entry blanks may be obtained from the "Advertising Division, E. I. du Pont de Nemours & Co., Wilmington, Delaware."

The American-La France Fire Engine Co., Elmira, N. Y., has recently made the following shipments: Toms River, N. J., type B hose car; Port Chester, Pa., type 12 combination chemical engine and hose car; Providence, R. I., two type 45 triple combinations; Lincoln, Ill., Brockway combination; Nahant, Mass., type 12 triple; Otisville, N. Y., type 10 combination chemical engine and hose car; Kellog, Idaho, type 40 combination chemical engine and hose car; Elmwood, Ind., type A hose car; Etna, Pa., two type B combinations; Corvallis, Ore., type 45 triple; Marion, Ind., type 12 pumping engine; York, Pa., type 45 combination chemical engine and hose car; Portland, Ore., type 45 combination; Greenwich, Conn., type 12 triple; Naugatuck, Conn., type 12 triple; York, Pa., type 45 combination; Butte, Mont., type 40 chemical engine; Appleton, Wis., type 12 combination; Bellair, Pa., type 12 triple.

"History's Lesson to the Motor Truck" is the subject of a new booklet, issued for general distribution, by P. W. Litchfield, vice-president and factory manager of the **Goodyear Tire & Rubber Company** of Akron, Ohio. This booklet is an important and interesting addition to motor truck trade literature. Mr. Litchfield has grasped the real significance of the motor truck's mission as an agent of transportation, and visualized a new era in transportation with fleets of motor trucks plying long distances, operating day and night on a regular schedule.

The present line of motor trucks which the Goodyear Tire & Rubber Company is operating between its factories at Akron, Ohio, and Boston, Mass., covering a round trip of more than 1,500 miles; is the product of his thought and perseverance. Nearly a year before the railroads became so congested with traffic as to jeopardize the efficiency of war preparations he foresaw the coming trouble and advocated a wider use of motor trucks in inter-city transportation.

The booklet, just issued, opens with a review of the progressive stages that transportation has passed through, from the camel to the latest forms of motorized vehicles. The change from wind and animal power to steam power is shown to have ushered in the modern era, and the inventions of the internal combustion engine and the pneumatic tire are credited with the wonderful revolution that motor transportation is inaugurating in the traffic world today. The trend of motor truck tire equipment is shown to be in the direction of pneumatic tires, which allow lighter chasses and bodies than those designed for use on solid tires, and allow heavier loads with no increased burden on the truck.

Pipe in Unusual Services.—A very interesting and well prepared booklet, containing photographs which should prove of interest to all users of pipe, has just been issued for free distribution by the **Central Foundry Company,** 90 West Street, New York, N. Y. The booklet especially features severe or unusual conditions under which Universal pipe has been laid. One illustration shows the pipe installed under flood conditions at Key West, Fla.; Universal pipe under 120 and 130 pounds pressure; Universal pipe laid on a dam which was afterwards washed away, leaving 72 feet of pipe suspended, but intact in every joint. A useful feature of the booklet consists of directions for laying Universal pipe.

PERSONALS

Dalzell, A. G., Asso. Mem. Can. Soc. C. E., and member of the Royal Sanitary Institute, has resigned his position of assistant city engineer of Vancouver, B. C. During the two years he held this position he designed and superintended the construction of 145 miles of sewers at a cost of $3,900,000.

Hanreddy, Joseph, well-known Chicago contractor, died at his home there on April 9. He was born in that city in April, 1864. His earlier work in the contracting business was confined usually to paving, but later he undertook larger jobs. Among the more important works carried out by him were the Lawrence Avenue intercepting sewer and part of the Southwest water tunnel under the city at Chicago; the Linnwood Avenue intake tunnel under the lake at Milwaukee, Wis., and the Lake Union tunnel at Seattle, Wash.

Whittington, W. W., mayor of Alexandria, La., died recently from peritonitis following an operation. He was serving a second term as mayor, having been first elected five years ago, when the commission form of government was adopted. Mr. Whittington was a native of Alexandria, 43 years old. He received his education in the city schools and at Tulane University in New Orleans. He was very successful in his business. In addition to his official duties he was interested in banking and several lumber enterprises, besides owning considerable real estate.

NEWS OF THE SOCIETIES

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States public health service, stationed in Edgecombe County, on developing county health work, and by Dr. S. A. Stevens of Monroe, Dr. Ben K. Hayes of Oxford and Dr. Z. M. Caveness of Raleigh.

Highway Traffic Association of New York.

A public meeting of the Highway Traffic Association of the State of New York will be held in the grill room of the Automobile Club of America, 247 West 54th street, New York City, at 8:30 p. m. on Friday, May 10, 1918.

Dr. John A. Harries, special deputy commissioner in charge of traffic, police department of the city of New York, will speak on the topic "Traffic Problems of the City of New York." The address will be followed by a general discussion.

Dinner, at $1.25 per cover, will be served in the grill room at 7 p. m. Any one wishing to attend the dinner should notify the secretary, Elmer Thompson, 247 West 54th street, New York City.

South Dakota Electric Power Association.

It has been decided to hold the annual convention of the South Dakota Electric Power Association on May 15 and 16. The meeting place will be the Carpenter Hotel, Sioux Falls.

Nebraska Association of Civil Engineers.

At a special meeting held by the members of the Nebraska Association of Civil Engineers, held recently in the Paxton Hotel in Omaha, in the interest of improved road conditions, T. H. McDonald, state engineer of Iowa, spoke of plans concerning the proper construction of good roads.

More than fifty members of the association attended the meeting, which was preceded by a banquet.

Mr. McDonald said: "State taxes on the valuation of farm property has never paid for the construction of maintenance of roads, as is shown by annual reports. Funds for the building of state roads have been created in cities, town corporations or from the taxes levied on automobiles."

George L. Campen is president of the Nebraska Association of Civil Engineers; Homer B. Kanouse is secretary.